# ATTACHMENT II-7

# CLOSURE PLAN

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# A. CLOSURE PLAN

## 1. INTRODUCTION

This closure plan is set forth to comply with the applicable requirements of Section R315-8-7-Closure and Post-Closure and R315-8-8-Financial Requirements of the Utah Code. The contents apply to the Grassy Mountain facility (GM), EPA ID# UTD991301748 to reflect the most current approved permit and facility operations. Detailed descriptions of the relevant units/areas are provided in the specific modules as referenced herein to the permit. Only general descriptions are provided within this plan. Specific closure plan information is identified for each individual unit and/or process area, within the overall facility, as appropriate. This information may be referenced as necessary to provide a comprehensive closure plan, which meets the stated regulatory requirements.

In compliance with applicable regulations, this plan sets forth the necessary actions and requirements to close GM in a manner that minimizes the need for further maintenance and controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters, or to the atmosphere.

In order to facilitate the development of a closure cost estimate for the entire facility, a sequence of closing the current waste management units is presented. However, the actual sequence of unit closures may be different than what is presented. The sequence of closing a unit in this plan is based on minimizing potential exposure of personnel to contaminants and the potential of releasing contaminants to the environment. It is less likely that this sequence will vary from that presented, but it is possible based on circumstances at the time of closure. The plan assumes maximum inventory levels by waste type and provides procedures for disposing of that inventory, for decontaminating and/or disposing of equipment and containment systems and for obtaining closure certification. The cost estimate assumes the use of third parties to perform all closure work.

## 2. FACILITY UNIT DESCRIPTIONS

### 4.1. General Information

### 4.2. Location

The Grassy Mountain facility is located approximately 83 miles west of Salt Lake City, Utah in Section 16 of Township 1 North, Range 12 West in Tooele County, Utah. The active site, that portion of the property used for active and closed waste management units, is located inside a fence and comprises most of this section. The waste management units are permitted for treatment, storage and disposal of hazardous waste pursuant to the regulations administered by the State of Utah and/or the United States Environmental Protection Agency. Attachment II-1 contains a site plan that shows locations of the various waste management units and the fenced portion of the section. In addition, the facility owns a ½ mile buffer around all of Section 16.

## 4.2. General Hydrogeologic Conditions

The facility is located upon exposed sediments of ancient Lake Bonneville. This geologic formation is a silty clay deposit believed to be up to 10,000 feet thick. It contains no potable water and subsurface water movement is extremely slow. The sediments underlying the site have a range in hydraulic conductivity of 1 x $10^{-4}$ to $10^{-6}$ cm/sec and extremely high sodium concentrations. Subsurface water contains total dissolved solids concentrations of 50,000 to 100,000 mg/l. The region receives approximately 6 inches of precipitation annually with evaporation rates of over 40 inches per year. There are no rivers or streams within 20 miles of the facility and the nearest body of water is the Great Salt Lake (30 miles east).

## 4.1. Hazardous Waste Storage/Treatment/Process Units

The following sections provide a description of the currently permitted hazardous waste management units and facilities subject to closure. The descriptions provide an accounting of units and containments which are covered by this closure and post-closure plan, so that future and pending modifications may be clearly delineated. More detailed unit information is provided within referenced permit modules for each unit at the facility.

## 4.2. Container Management Facility (Module III)

The Container Management Facility is an elevated slab, pre-engineered steel roof and side wall structure. Physical features of the structure prevent escape of contaminants should spills or leaks occur and protect the unit from weather and precipitation while the containerized waste material is being managed prior to disposal. The unit has separated drainage areas provided by concrete containment curbing, sumps for containment, and ramps for access. The slab and sump structures are constructed with waste compatible joint materials and water stops to prevent intrusion by waste into the structural unit, as well as leakage through the unit to underlying soils. The Container Management Facility consists of the following units:

Management Unit
Dock 1 (TD01)
Pad 2 (SP01 & NP01)
Pad 3A (TD02)
Pad 3B (SPAD)

Dock 1 is designed and permitted to store flammable wastes. Flammable wastes are not stored in other areas. Storage Pads 2 and 3 are utilized to store all other wastes accepted at the facility, including wastes not subject to regulation under Subtitle C of RCRA.

## 4.2. Facility Tanks

Specific details about the tanks discussed in this section are contained in Table A, "Existing Tanks, Information Summary". Facility Tanks Include:

Wastewater Treatment Tanks (inactive)
Stabilization Tanks
Waste Solvent Tanks (inactive)
Leachate Treatment Tanks

Some of the tanks have ancillary pipes and valves, and other tank equipment. All are located within secondary containment. Secondary containment areas are comprised of concrete slabs with containment curbing, sumps for collection/containment of run-off from selected portions of the units and secondary containment/leak detection in tank areas. All floor slabs, containment and sump structures are constructed with waste compatible joint materials and water stops to prevent intrusion by waste into the structural unit, as well as leakage through the unit to underlying soils.

**4.4.** Wastewater Treatment Tanks

The Wastewater Treatment (WWT) Tanks are located in three (3) segregated, concrete secondary containment systems. A list of the tanks located within each of these secondary containment areas is given below. The tanks are empty, clean and are inactive, but not closed; therefore no inventory of wastes is associated with these units. Re-cleaning is assumed for closure. Piping, valves, pumps and other ancillary tank equipment have been removed and are not included in the cost of closure.

| | Tank(s) |
|---|---|
| (2) Caustic Liquid Storage | 121-TN-004 and 121-TN-005 |
| (2) Acid Liquid Storage | 121-TN-002 and 121-TN-003 |
| (1) Treated Liquid Storage | 121-TN-006 |

**4.4.** Waste Stabilization Facility

The Waste Stabilization Facility consists of open-top, square tanks, in which reagents are mixed with the wastes, typically using a backhoe/trackhoe type device. Since the tanks are not storage units, there is no inventory of wastes associated with these units. The facility containment areas include open tank treatment units and secondary containment, transport vehicle unloading areas, treated waste haul vehicle staging areas and ramps for access.

| | |
|---|---|
| Waste Stabilization Tanks | 122-TN-001, 122-TN-002, 122-TN-003 |

**4.4.** Waste Solvent Tanks

The waste solvent tanks are horizontal, aboveground, steel tanks set on reinforced concrete saddles. The tanks have been emptied, cleaned and are inactive, but not closed; therefore no inventory of wastes is associated with these units. Re-cleaning is assumed for closure cost estimate purposes.

| | |
|---|---|
| Waste Solvent Tanks | 117-TN-001 and 117-TN-002 |

**4.4.** Leachate Tanks

The Leachate Tanks are located in two (2) segregated but contiguous, secondary containment areas. RCRA leachate is stored in the four (4) tanks prior to disposal.

| | |
|---|---|
| Leachate Storage Tanks | 119-TN-001, 119-TN-002,<br>119-TN-003, 119-TN-004 |

### 4.2. Surface Impoundment Unit (Module V)

Surface Impoundments A is a 1,430,000-gallon, above-grade, impoundment with a surface area of approximately one acre and a maximum depth of approximately 15 feet. In October 1988 the unit was retro-fitted with a double synthetic liner and leak detection system to meet the minimum technology requirements for hazardous waste surface impoundments (R315-8-11.2(f) and 40 CFR 264.221(c). This unit is currently only used for non-hazardous waste. Prior to closing this unit, receipts of wastes would be stopped and the balance allowed to evaporate. Thus, no capacity is considered in computation of maximum inventory of waste for this unit. Decontamination and disposal of the unit liner is included in the closure cost estimate.

### 4.2. Landfill Disposal Units (Module VI)

Grassy Mountain currently has four active hazardous waste landfill disposal cells approved for operation: Cells 4, 5, 7. and B/6. Unit-specific final closure design engineering reports are submitted at the time of closure for each cell in accordance with Module VI of the Part B permit, R315-8-7, R315-8-14.5 and any approved or required applicable modifications. Future planned closures will utilize an approved Geosynthetic Clay Liner (GCL) closure design. The revised typical closure plan design that includes GCL is shown in Module VI. All closure activities shall be in compliance with the CQA Plan for Landfill Cell Construction.

## 3. PARTIAL FACILITY CLOSURE ACTIVITIES

Due to the size and complexity of the facility, partial closure activities are common. This activity will be implemented most often to facilitate the upgrade of treatment, storage and disposal facilities to more technically, advanced units, to close out-of-date or uneconomic processes, to close landfill cells, and to dispose of expendable supplies. In order to facilitate delineation of typical, partial, facility closure activities, this section will first present a typical, final closure activity scenario based on the conditions of the current facility. The final closure scenario is used as the basis for the closure cost estimate. The final closure scenario is envisioned as follows:

A number of operational units must remain functional to assist in the final closure of the facility. Since it is required that a landfill unit with adequate capacity to contain the final inventory of wastes and contaminated materials remain available for final closure, at least one of the hazardous waste landfill cells will be allocated for the final closure. This landfill will, at least, have available the volume listed under "On-site Management - Landfill Disposal", in Table B, for compliance with Landfill Capacity Assurance requirements. The Leachate Storage Tanks will be required to store the landfill leachate liquid prior to shipping it for disposal during final closure and through post closures of the facility. It is expected that the container management facility and the stabilization system will remain operational until just before final closure of the last open landfill. These will remain open to ensure the proper handling of remaining wastes and waste residues, in accordance with regulations at the time of closure.

Other final closure activities include site monitoring, routine site inspections, groundwater monitoring, decontamination of equipment, structures and areas, and verification sampling and analytical efforts. A summary of the major facility process areas or portions thereof, which likely will remain operational until final closure, follows:

- Hazardous Waste Landfill Cell
- Leachate Storage Tanks
- Stabilization Treatment Tank System
- Container Management Facility

Utilizing this information, all other facility units and/or process areas, or portions of those listed above, may be subject to the partial closure scenario. Each of the major facility process areas have been evaluated for this possibility and specific tasks within this site-wide closure plan, have set forth the necessary elements of partial closure within the requirements of the regulations. Each process area's closure activities meet the regulatory requirements for final closure as presented in R315-8-7 and 40 CFR Part 264 Subpart G, with the exception of notification and certification requirements for tanks and container storage areas. Notification and certification of closure of these non-disposal units is not required until final closure in accordance with current regulations. If however, certification of a closed area under partial closure is made, it will not have to be certified again at the time of facility closure. Candidates for partial closure based on current facility operations include but are not limited to:

- Portions of the Container Management Facility
- Wastewater Treatment Tanks
- Portions of the Vat Stabilization Tank System
- Waste Solvent Tanks
- Portions of the Leachate Treatment Tank System
- Surface Impoundment Unit
- Individual Hazardous Waste Landfill Cells

Partial closure includes discontinuance of use, removal of wastes and residues, and cleaning the particular unit, apparatus or area, as applicable, with or without filing for notification or certification of final closure. Partial closure of any unit may take place at any time. (Note: The Wastewater Treatment Tanks and Waste Solvent Tanks have already been subjected to partial closure and all tanks within these systems are inactive).

Equipment after decontamination may, at the discretion of the owner or operator, remain in place or may be removed. If an item cannot be decontaminated it must be removed for disposal. If an item cannot be decontaminated in place, it will be removed and either disposed or decontaminated in a fixed or temporary containment area.

## 4. MAXIMUM EXTENT OF OPERATIONS

According to Utah Regulations and 40 CFR Part 264, Subpart G, this closure plan delineates the maximum extent of operations of the current facility. This is utilized as a “worst case" scenario for unexpected closure at any time during the facilities operation.

### 4.1. Management of Maximum Inventory

The information provided in Table A describes the capacity of each unit/area considered at the maximum extent of operations for the facility at any given time during the permit period. Capacity information is used to reasonably quantify the inventory for removal, treatment, transport and/or disposal, as appropriate, at the time of closure. An estimate of residual waste

generated during closure procedures (e.g. decontamination of units and soils and residue clean-up from routine operations/treatment) is provided based on the facility decontamination portion of the closure plan. Remaining waste inventory and decontamination residuals are two categories of potential hazardous wastes to be managed during facility closure.

## 4.2. Estimate of Maximum Remaining Waste Inventory

No waste inventory is attributable to the open landfill cells since such cells would be receiving wastes for disposal - not generating wastes from closure of the units. Liquids that may be present in the surface impoundment at the time of final closure are assumed to be evaporated prior to closure. Therefore no costs are associated with management of the potential surface impoundment inventory.

The potential maximum inventory of wastes contained in Table A is assumed to be the amount in storage at the time of closure. Assumed maximum waste inventory at the time of closure is based strictly on the capacity of the container management facility, and capacities of current, active, tank systems.

**Table A: Maximum Inventory at Time of Closure**

| STORAGE UNIT NAME | MAXIMUM INVENTORY |
|---|---|
| **Container Management Facility**<br>**Pad 2**<br>**Pad 3A (TD02)**<br>**Pad 3B (SPAD)** | 107,800<br>or<br>1,960 55-Gallon Equivalents |
| **Container Management Facility**<br>Flammable Storage (TD01) | 18,850 Gallons<br>or<br>342 55-Gallon Equivalents |
| **Leachate Tanks**<br>119-TN-001<br>119-TN-002<br>119-TN-003<br>119-TN-004 | 70,600 |
| **Stabilization Tanks** | 0 |
| **Waste Solvent Tanks (Partially Closed)**<br>117-TN-001<br>117-TN-002 | 0 |
| **Waste Water Treatment Tanks (Partially Closed)**<br>121-TN-002<br>121-TN-003<br>121-TN-004<br>121-TN-005<br>121-TN-006 | 0 |
| **Bulk Solids Storage Area** | 1,010,000 |

## 4.2. Maximum Inventory Management - Container Management Facility

Flammable wastes located on Drum Dock 1 will be prepared for transport off-site for incineration (or other acceptable form of treatment) and/or re-use. The preparation process will include such items as re-containerization (as; required for un-road-worthy containers), analytical testing (which may be required), manifest preparations for transport, and container loading. Wastes will be handled in accordance with Utah statutes and applicable requirements of 40 CFR Part 262.

All Other Containerized Wastes (Storage Pad 2 and Storage Pad 3) will be disposed in an on-site landfill after any necessary or required treatment or amendment activities are performed. Any handling and processing of this containerized inventory will be performed in accordance with the current permit conditions and applicable regulations at the time of closure.

**4.4.** Maximum Inventory Management – Inactive and Active Tank Systems

Stabilization tanks are not used for storage so there is no associated waste inventory. No waste is considered in inventory for listed, inactive tanks that have been previously emptied and cleaned as described within this plan. At least some of the leachate tanks will be needed through post-closure and thus will not be closed until the end of the post-closure period. The total permitted volume is considered to be disposed, however, for closure cost estimate purposes since the actual number of tanks that will remain during post closure is not known. The tank capacities for the computations of inventory have been taken from Module IV of this permit (inactive tanks and stabilization tanks are only listed for completeness).

### 4.2. Estimate of Closure - Generated Residual Waste lnventory

Table B, "Closure Waste Inventory/Decontamination Residue Quantity Estimates" summarizes the estimates of closure-generated residual waste as necessary to quantify closure management costs. Estimates are based on the decontamination methods and practices anticipated to be employed for the various units and are categorized according to the final management anticipated. The table provides a summary of the details presented in Appendix 1, "Cost Documentation Appendix (CDA)," and the closure cost "Worksheets." The table outlines estimated landfill capacity assurance quantities, as required.

**Table B: Closure Waste Inventory / Decontamination Residue Quantity Estimates**

| UNIT DESCRIPTION | OFF-SITE MANAGEMENT | ON-SITE MANAGEMENT (LANDFILL DISPOSAL) | |
|---|---|---|---|
| | WASTE INVENTORY (55-Gallon Equivalents) | WASTE INVENTORY (Cubic Yards) | DECONTAMINATION RESIDUAL INVENTORY (Cubic Yards) |
| Container Management Facility (CMF-1) | 538 (CMF-1,1e) | 591 ( CMF-1, 7a) | 110 (CMF-2. 4q) |
| Bulk Solid Storage Areas (BSSAs) | N/A | 3,200 (CMF-1, 1h) | N/A |
| Put-Piles in Landfill | N/A | 11,483 (CLO-1,3q) | N/A |
| Wastewater Treatment Tank System | N/A | N/A | 15.4 (CLO-3, 2s) |
| Stabilization Tank System | N/A | N/A | 84 (CLO-3, 3s) |
| Waste Solvent Tank System | N/A | N/A | 20.8 (CLO-3, 4s) |
| Leachate Tank System | N/A | N/A | 37.2 (CLO-3, 5s) |
| Surface Impoundment Unit A | N/A | N/A | 2,409 (CLO-3, 6q) |
| Ancillary Closure Activities | N/A | N/A | 1,010.9 (CLO-6, 9b) |
| **SUMMARY TOTALS:** | **538** | **15,274** | **3,687.3** |
| | | | |
| **"Landfill Capacity Assurance" Requirement at the Time of Closure:** | | | **18,961.3** |

Note:
The information presented in this table has been consolidated from the closure cost worksheets (CMF and CLO) and Appendix 1, "Cost Documentation Appendix".

### 4.2. Procedures for Handling Hazardous Waste Inventory and Decon Residues

This section presents a general discussion of typical management activities for the waste streams expected to comprise the inventory. Specific procedures related to a particular unit are included in the detailed closure cost estimate work sheets and cost documentation Appendix. Specific waste streams and any ancillary handling requirements such as removal, containerization and transportation, are included in the cost estimates as required for financial assurance.

### 4.4. RCRA/TSCA Waste Stream Inventory Management

It should be noted that less than 5% of the total waste inventory of the Container Management Building may be RCRA/TSCA combination waste materials. These materials will not materially affect the cost of disposal of inventory as they will either be calculated into the landfillable volume or into the incinerable volume as the closure plan exists today.

### 4.4. On-Site Management

In general, management activities related to the hazardous waste inventory will be handled on-site. As an example, the current facility has the capability of performing such activities as: containerization and re-containerization of wastes as necessary, off-site shipment of non-landfillable wastes, stabilization of residues and (inventory) waste streams, hazardous waste landfill disposal, providing and using container handling equipment and facilities, and mobilization of other equipment as necessary. These management activities reflect a continuation of current, routine, operating practices at the site.

### 4.4. Off-Site Management

The off-site management practices expected for closure are the manifesting and loading of wastes destined for incineration or other suitable organic waste management practices, and disposal of leachate and decontamination liquids. It is assumed for closure cost estimate purposes that the waste inventory from Drum Dock 1 at the Container Management Facility will be shipped to an incinerator.

## 5. FACILITY DECONTAMINATION

General facility areas subject to processing hazardous waste will receive a final evaluation of the necessity for decontamination. All such areas (e.g. roads, staging areas, scale areas, laboratory, truck/wheel wash units, etc.) subject to possible minor spills, drips and resultant residue will be handled in accordance with routine housekeeping procedures as required by Module II and Grassy Mountain Policy.

This section presents a discussion of typical decontamination procedures for all operational areas/units. The criteria, procedures and methods of decontamination presented are typical in nature and present a functionally equivalent industry standard. Individual circumstances at the time of closure may require optional approaches to typical decontamination efforts listed below. The closure standards are performance based and thus specifying the exact method of achieving decontamination is not provided. However, the typical methods described have been used to develop the closure cost estimate.

Implementation of Module VIII will, for any portion of the facility at the time of partial closure of a unit or area or total closure of the facility, take precedence over the decontamination procedures described in this closure plan and will, when completed, meet closure requirements.

## 4.1. Contaminated Equipment, Structures and Facility Areas

The contaminated equipment, structures and other areas to be decontaminated are: the Wastewater Treatment Tanks (inactive), Stabilization Tanks, Waste Solvent Tanks (inactive), Leachate Treatment Tanks, and the Container Management Building

The container management containment surfaces will be assumed to be contaminated. Storage tanks listed in Section 4, Table A are considered to be contaminated even if they are in a clean condition after being placed on an inactive status. The surface impoundment will also require cleaning as part of closure. Details for each specific unit/process area component are considered below and delineated further on the closure cost estimate Worksheets (CMF and CLO) and Cost Documentation Appendix (CDA). Final Closure Costs based on the listed criteria and assumptions are tabulated in Section 14, "Financial Requirements for Closure".

## 4.1. Typical Decontamination Procedures

## 4.2. Remove Waste Inventory

The waste inventory will be processed and/or treated in accordance with current regulations, the procedures outlined in the permit and/or Waste Analysis Plan. As noted previously, RCRA/TSCA combination waste streams will not alter the combination of waste types or disposal methods already in place in this RCRA Closure Plan.

## 4.2. Inspection of Areas/Equipment

Inspect slab areas, tanks, ancillary process equipment, liquid transfer lines, sump structures and secondary containment areas for spills or evidence of spills, leaks, cracks or other evidence of potential release of contaminants to the environment and document the findings.

**4.4.** Remove any accumulated materials; i.e. dust, dirt, etc., that would inhibit recognition of spills or releases during the decontamination process;

**4.4.** Inspect containment surfaces for cracks, holes, or evidence of potential leakage or loss of integrity and

**4.4.** Perform a twenty-four hour hydrostatic test over the surfaces with cracks to determine if the containment system integrity had been lost, and

**4.4.** Remove and dispose of the water as hazardous waste (solidify and place in the landfill), and

**4.4.** Identify and record the location of damage which could have caused the loss of integrity of the containment system if leakage is quantified during the test and use this information to accomplish step 5.2.6.3 after decontamination of the containment surfaces, and

**4.4.** Repair any cracks or other damage to containment surfaces that could release waste waters to the ground during decontamination efforts.

**4.2. Decontamination of Areas/Equipment**

**4.4.** Decontamination of tanks and/or piping in place or remove them to fixed or temporary containment for decontamination utilizing decontamination methods for hard surfaces;

**4.4.** Decontaminate tanks and equipment inside and out;

**4.4.** Remove equipment from containment as necessary to ensure the containment surfaces are properly decontaminated;

**4.4.** Dispose of tanks and equipment in lieu of decontaminating them.

**4.2. Decontaminate Structures**

Decontaminate structures removing all stains (chemical stains do not have to be removed) utilizing decontamination methods for hard surfaces (6.1);

**4.2. Decontaminate Secondary Surfaces**

Decontaminate secondary containment surfaces utilizing decontamination methods for hard surfaces;

**4.2. Re-Inspect**

Re-inspect all sump areas, secondary containment and leak detection systems for cracks, holes, or evidence of potential leakage or loss of integrity that was not identified prior to initiation of closure and EITHER:

**4.4.** Perform a twenty-four hour hydrostatic test on the surfaces with cracks to determine if the cracks were a potential route outside the containment system. If leakage is quantified, sampling is required (5.2.6.3), and 5.2.7;

**4.4.** Remove the water from the containment system. The water shall be managed as a hazardous waste when the testing has been completed, OR

**4.4.** EITHER

**4.4.** Collect core samples of the soil and/or concrete to confirm or refute the suspicion of contamination of the subsoils. If contamination is confirmed, go to step 5.2.6.5 and 5.2.6.6.

**4.4.** Remove all concrete and soil within six inches of the crack and dispose of it as contaminated.

**4.4.** Sample the soil from the trench left after removing the concrete and analyze for volatile, semi-volatile and pesticide/herbicide parameters listed in 40 CFR 264 Appendix IX. Continue expanding the trench both laterally and vertically until

the analyses of the samples come back less than or equal to the concentrations listed in the 40 CFR 264 Appendix IX and dispose of the removed soil according to the current regulatory requirements.

### 4.2. Soils Adjacent to the Unit

This sections applies to soils immediately adjacent to the units within six (6) feet [or ten (10) feet in the case of the Container Management Facility] of the outside of the containment areas and in areas where trucks or other equipment had been staged for storage or transfer of wastes.

**4.4.** Inspect the area and map the location of stained or discolored soils,

**4.4.** Remove the top six (6) inches of exposed soils, and

**4.4.** Take a grab sample of the excavated soil from each excavated area and analyze it for volatile, semi-volatile and pesticide/herbicide parameters listed in 40 CFR 264 Appendix IX, and for PCB's for the current SW-826 method and using the numerical standards set-forth in the PCB Commercial Storage Closure Plan.

**4.4.** If the analysis shows levels at or below those listed, the unit may be declared closed and the soil disposed of in the landfill.

**4.4.** If the analysis shows levels above those listed, dispose of the soil (landfill disposal id assumed) according to the regulations and proceed with 5.2.7.4*.

**4.4.** Sample and analyze the soil from areas where the soil has been removed

1....1 Take surface (0" to 6") grab samples approximately every 50 feet.

1....2 Take additional surface (0" to 6") grab samples from the locations of stained or discolored soils identified prior to removing the surface layer of soils.

1....3 Analyze soil samples for volatile, semi-volatile and pesticide/herbicide parameters listed in 40 CFR 264 Appendix IX and for PCB's for the current SW-826 method and using the numerical standards set-forth in the PCB Commercial Storage Closure Plan.

1....4 Remove at least six (6) inches of soil and repeat steps 5.2.7.4.1 through 5.2.7.4.4 until the soil no longer exhibits levels of volatile, semi-volatile and pesticide/herbicide parameters as listed in 40 CFR 264 Appendix IX

### 4.2. Personal Protective Equipment

Equip the personnel involved in the decontamination process with appropriate personal protective equipment as designated by the closure safety officer.

### 4.2. Decontaminate Equipment Used

Decontaminate or dispose of equipment used in the decontamination process, to transport, and/or participate in final on-site disposal according to the decontamination procedures in this plan

### 4.1. Surface Impoundment Unit Decontamination

Surface Impoundment A is a triple-lined impoundment (two synthetic, one clay) with a primary and a secondary leak detection/removal system. The basic components include clay liner and berms, 80 mil HDPE primary liner, 100 mil secondary liner, PVC and HDPE piping, synthetic drainage net, geotextile fabric, concrete pipe supports, gravel drainage media, and gravel armor for exterior berm protection (details of the design are contained in Module V of the permit). The surface impoundment will be closed "clean" pursuant to the requirements of R315-8.11.5(a)(1). In compliance with these requirements, unit hard surfaces will be cleaned as indicated in Section 6, Criteria for Evaluating Decontamination. The hard surfaces may be disposed of instead of decontaminated at the discretion of the Permittee.

### 4.2. Remove Wastewater

Remove wastewater (may be allowed to evaporate) and solid residue and manage in accordance with the waste analysis plan.

### 4.2. Clean the Surfaces

Clean the primary and secondary liners and drainage nets to a hard surface standard. Treatment of rinse waters will depend upon the waste codes associated with the surface impoundment. For closure cost purposes, it is assumed the rinse waters are disposed of as leachate.

### 4.2. Remove the Primary and Secondary Surfaces

Remove and cut the primary and secondary liners and associated drainage nets into sections of manageable proportions for disposal. Reuse of these sections is acceptable at either Grassy Mountain or other hazardous waste facilities. (Disposal is assumed for closure cost purposes.)

### 4.2. Remove the Geotextile Surfaces

Remove and cut the geotextile under layer into sections of manageable proportions for disposal. Reuse of these sections is acceptable at either Grassy Mountain or other hazardous waste facilities. (Disposal is assumed for closure cost purposes.)

### 4.2. Remove the Leachate Collection System

Remove the leachate collection system components for disposal. Reuse is acceptable at either Grassy Mountain or other hazardous waste facilities. (Disposal is assumed for closure cost purposes.)

### 4.2. Examine the Clay Liner

Examine the clay liner for visual evidence of contamination.

**4.4.** Take grab samples of the visually contaminated areas;

**4.4.** Analyze the samples for parameters appropriate for the waste managed in the surface impoundment;

**4.4.** Remove visually contaminated soil for disposal (assumed to be landfill disposal) if required, based on the analyses of the samples;

**4.4.** When no visual contamination is found, samples will be taken from the areas of most likely to be contaminated (the sump area) and analyzed. The results will determine reuse or disposal of the clay.

### 4.2. Clay Liner Removal

Leave the clay liner in place or remove and stockpile it for future use.

### 4.2. Groundwater Monitoring Wells

Groundwater monitoring wells utilized for monitoring of Surface Impoundment A (MW10, MW11 & MW12) shall continue to be monitored.

**4.4.** Sample these wells and analyze the samples in accordance with Module VII of the Permit upon closure of this waste management unit.

**4.4.** Continue routine groundwater monitoring for one year after closure.

**4.4.** Review the data collected for this final year, as well as the complete historic monitoring results.

**4.4.** Ensure that no statistically significant hazardous contamination has been detected.

**4.4.** If none, abandon the monitoring wells in-place or remove in accordance with regulatory or industry-established standards.

**4.4.** If some, follow Module VII & VIII for corrective actions.

## 6. CRITERIA FOR EVALUATING DECONTAMINATION

### 4.1. Closure of "Hard Surface" Waste Treatment or Containment Items

Closure of "hard surface" items (steel tanks, concrete containment, equipment, HDPE liners, etc.) are performance-based and any cleaning method may be used to achieve the standard. No actual, direct testing of the surfaces is intended, as there are no general “wipe tests" which have been approved or designated for the constituents identified in Table C. The standards for successful decontamination vary with this disposition of the items being decontaminated as follows:

### 4.2. Unrestricted Use

Decontamination may be declared when rinse water of the item(s) being decontaminated meets the parameters and concentration limits listed in Table C, “Decontamination Wash Water Analysis".

### 4.2. Left On-Site Or Sold To An Equipment Broker, For Which No End User Is Known

Decontamination may be declared when the visual standard set forth in 40 CFR 268.45 for a “clean debris surface" is met and at least 10% of like items from a given waste area have been

rinsed and the rinse water of the item being decontaminated meets the parameters and concentration limits listed in Table C.

### 4.2. Items To Be Used In Industrial Services That Are Not Related To Food, Feed or Drinking Water, Or Are To Be Scrapped For Remelt

Decontamination may be declared when the visual standard set forth in 40 CFR 268.45 for a “clean debris surface" is met.

### 4.2. Items Being Sold For Reuse In Used Oil Service, Low Level Radioactive Waste Service, Or Other Industrial Services Approved by UDEQ

Decontamination may be declared after a single pass with a pressure washer, sandblaster or equivalent means is used to remove residue (without disassembly) from the interior of the equipment and the exterior is cleaned to either the rinsate standard in Table C or the visual standard set forth in 40 CFR 268.45 for a “clean debris surface” is met.

### 4.2. Items Being Sold For Reuse In Hazardous Waste Service

Decontamination may be declared after a single pass with a pressure washer, sandblaster or equivalent means is used to remove residue (without disassembly) from the interior of the equipment and the exterior is cleaned to either the rinsate standard in Table C or the visual standard set forth in 40 CFR 268.45 for a “clean debris surface" is met. If the unit is not to be containerized during shipment, the exterior must be cleaned to either the rinsate standard (Table C of this plan) or the visual standard set forth in 40 CFR 268.45 for a clean debris surface.

### 4.2. Debris To Be Disposed Of In A RCRA Landfill

Decontamination may be declared after a single pass with a pressure washer, sandblaster or equivalent means is used to remove residue.

### 4.2. Numerical Standards for PCB Decontamination

Because, after closure, the structures and/or land will be converted to another use, the site shall be cleaned up to the non-restricted, high occupancy area requirements. Target levels for this classification are described below:

- High contact indoor or outdoor solid surfaces shall be cleaned to 10-micrograms/100 $cm^2$ (as measured by standard wipe test).
- Low contact, outdoor, impervious solid surfaces shall be cleaned to 10-micrograms/100 $cm^2$ (standard wipe test).
- Low contact, outdoor, non-impervious solid surfaces shall be cleaned to 10-micrograms/100 $cm^2$.
- For spill cleanups, PCB contaminated soil shall be removed to 10 ppm, provided that soil is excavated to a minimum depth of 10 inches. The excavated soil shall be replaced with clean soil (< 1 ppm PCBs).
- As Bulk PCB Remediation Waste, PCB contaminated soil and other non-impervious surfaces shall be removed to 1 ppm.

**Table C: Decontamination Wash Water Analysis**

| PARAMETERS | MAXIMUM CONCENTRATION INCREASE (mg/l) (See Note) |
|---|---|
| Oil and Grease | 15.0 |
| Phenols | 0.2 |
| Arsenic – T | 0.1 |
| Barium – T | 5.0 |
| Cadmium – T | 0.03 |
| Copper – T | 1.0 |
| Lead – T | 0.1 |
| Mercury – T | 0.005 |
| Selenium – T | 0.05 |
| Silver – T | 0.1 |
| Total Organic Halides (TOX) | 0.5 |
| Total Organic Carbon (TOC) | 40.0 |
| Cyanides | 0.2 |

Note:
The values given are the maximum allowable increase in a parameter, above the level that exists in the final rinse water prior to use. This "prior existing level" shall be established as the average of at least three (3) analyses of the rinse water, plus three (3) standard deviations. These analyses will be made at the time of closure, when a water source is known.

NOTES to Table C, Decontamination Wash Water Analysis:

1. Many different waste codes will be handled throughout the Grassy Mountain facility. Over its operating lifetime, it is likely, that each unit will eventually handle practically all waste codes actually received, either directly or through the "mixture" and "derived from" rules. From a regulatory viewpoint, then, the potential variety of contamination at all units will be identical. Therefore, only one list of parameters will be considered. This list will be used for all waste management units throughout the facility.

   The parameters listed in Table C are intended to represent the contaminants likely to be present in the highest levels, and to give an indication of potentially toxic constituents. It must be noted that many of the constituents of concern - the organics, especially the chlorinated organics - are volatile and will likely vaporize for the most part prior to or during the cleaning process itself. The loss of these relatively small amounts of materials is considered unavoidable and non-threatening to the environment or the general public. Any remaining heavy, residual organics will be included by the analyses for Oil and Grease, TOC,

and/or TOX. All of these parameters will detect general contamination to relatively small values.

It must also be remembered that the decontamination procedures listed in the application apply only to surfaces which are relatively impermeable (designated as "hard surfaces"). They will be used only for high-density polyethylene, concrete and metallic items, such as tanks. Any porous material, such as soils is intended for landfilling or other EPA/State approved treatment technologies. For most of the items to be decontaminated, a visual inspection will be as useful as actual analysis of the wash; however, to provide a quantitative, objective measure of contamination (or the absence thereof), and a historical record, these analyses will be conducted as defined for "hard surfaces".

Wide ranging analyses for specific organic chemicals, such as that achieved by GCMS, will not provide significantly more useful information. In addition, these analyses take considerable periods of time, during which site conditions would have changed markedly (due to continuing exposure to the elements). The parameters chosen will adequately sample for all constituents of real concern, or for indicators of those constituents.

It is expected that both field and laboratory methodology will change considerably between the time of permit issuance, and the time of actual closure. However, to cover the possibility of earlier closure of some units this sampling and analysis plan will apply.

The limits chosen were based on the recognition that it will be highly impractical, if not Impossible, to use "detection limits" as a cleanup standard. This is because the water used for the cleanup will likely have naturally occurring contamination that far exceeds detection limits in many cases.

This would be the case even if planned potable water were used for the equipment wash down. Grassy Mountain may use process water for the decontamination of the facility that does not meet drinking water standards, but will be significantly cleaner for most parameters than the ground water existing under the site. "Cleaning" waters may have relatively high levels of contamination, compared to "detection limits", before any wash down occurs. The levels listed in Table C were chosen based upon these considerations.

### 4.1. Decontamination Residuals Management

### 4.2. Determine Disposal Method

Determine the appropriate disposal method of residual wastes generated during closure utilizing the standards of 40 CFR 262.11.

### 4.2. Solids

Solids will generally be treated, if required, and landfilled.

### 4.2. Wash and Rinse Water

Wash and rinse water or other cleaning residues will be collected and handled as hazardous waste. The Closure Cost Estimate assumes that 5% of these residues will need to be treated,

stabilized and landfilled and the liquids will be disposed of appropriately off-site. However, it is possible that the wastewater may also be stored in the leachate storage tanks and disposed of as leachate. Although wash water may be stabilized on-site, treated at a facility with an NPDES permit and discharged, deep well injected, or incinerated, etc., the method actually used will be decided at the time of closure, based upon site availability, regulatory approvals, and economics. The closure cost estimate assumes that liquids are sent to a facility with an NPDES permit and discharged.

If wash or rinse water is contaminated with PCBs, the wash or rinse water will be incinerated.

## 7. CLOSURE CAPPING OF LANDFILL CELLS

### 4.1. Final Cover System

Closure of the facility will require the application of the designed final cover system to all open hazardous waste landfill cells at the facility. All such landfill cell closures shall meet the requirements of UHWMR R315-8-7 and R315-8-14.5 and this permit.

### 4.1. Intent to Begin Closure

Notification of intent to begin closure activities, affecting an individual landfill cell, or partial/final closure of the facility will include, for plan approval, a unit-specific closure plan application for final cover. Typical major components of any closure application for the final cover of any cell(s) is listed below:

### 4.1. Design Engineering Report (DER)

A Design Engineering Report (DER) with commentary that may include such design considerations as:

- Preparation of waste mound materials and surface prior to placement of final cover;
- Design considerations to accommodate settlement and subsidence of the final cover, considering initial settlement, primary and secondary consolidation, slope stability and all historic experience concerning these issues at the site;
- Design modifications to reflect recent technological advancements of any portion of the design or Construction Quality Assurance Plan (Attachment VI-2). This will include design changes, which are a result of site-specific (or other related) experience concerning a design or construction element.

### 4.2. Engineering Drawings

Engineering Drawings for the final cover of the specific cell(s), which demonstrate that the requirements of R315-8-14.5(a) have been complied with.

### 4.2. Construction Quality Assurance Plan (CAQ)

The most recent Construction Quality Assurance Plan (CQA) (Attachment VI-2) approved for landfill construction by the regulatory authority applicable to the particular cell(s) designated for closure.

### 4.2. Closure Plan Approval Application

The application for closure plan approval for the facility includes an engineering report and any necessary engineering drawings and specifications, as applicable, for the disposal of all treated leachate from the closed units during the closure activities and the post-closure period.

### 4.2. Closure Certification

Final cover closure activities shall meet the closure certification requirements outlined in Section 11.

## 8. GROUNDWATER MONITORING REQUIREMENTS

The groundwater monitoring requirements during partial or final closure does not change from that during the facility operation, which is governed by Module VII of the permit. Module VII provides for groundwater monitoring of all land disposal units at the facility including those subject to Utah Solid Waste Management Rules, Utah Hazardous Waste Management Rules, RCRA (Resource Conservation and Recovery Act) and TSCA (Toxic Substances Control Act) for the PCB Cells on site.

Module VII allows routine operational, closure and post-closure groundwater monitoring for the TSCA waste management areas to be governed by EPA's PCB Approvals for these units. These approvals are more stringent than or equivalent to the Module VII requirements.

The site will maintain the groundwater monitoring protection program including all monitored wells active at the time of closure. However, the TSCA cell monitoring wells are excluded from the closure cost estimate. Those groundwater monitoring costs are accounted for in the closure cost estimates in the EPA's PCB Approvals for those units. Below is a current list of the all Grassy Mountain land disposal units and their associated number of monitoring wells.

| AFFECTED UNITS | MONITORING WELLS |
|---|---|
| RCRA/Utah HWMR Units<br>(Landfill Cells 1, 2, 3, 4, 5, 7 & IWC-1 and IWC-2) | 34<br>(Includes 4 background wells) |
| Industrial Landfill Cell 3 | 3 |
| TSCA/RCRA Cell B/6 | 9 |
| TSCA Regulated Units<br>(Cells X, Cell Y, & Cell Z ) | 15 |

## 9. ANCILLARY CLOSURE ACTIVITIES

At the time of closure, either partial or final, there will be pertinent activities which will be necessary to ensure that the closure activity will satisfy the requirements set forth by R315-8-7, or more specifically 40 CFR 264.112 (b)(5). These ancillary activities will include leachate management, run-on/run-off control, and site security, described below.

**4.1. Leachate Management**

**4.2. Leachate & Landfill Cells**

Apply leachate management during closure activities only to the land disposal units.

**4.2. Management of Leachate and Leachate Collection Systems**

Manage leachate and leachate collection and removal systems in accordance with Module VI of the facility permit and applicable regulations.

**4.2. Monitor and Maintain Records**

Monitor and maintain records for each leak detection/collection system in accordance with the requirements of Module VI of the permit.

**4.2. Leachate Storage**

Collect and store leachate in the leachate storage tanks prior to shipping the leachate off-site for disposal. This disposal method is assumed for closure cost estimate purposes. However, any appropriate treatment or disposal method available at the time of closure may be utilized at the discretion of the Permittee.

**4.2. Routine Maintenance**

Perform all routine maintenance and repairs necessary for the proper operation of the leachate management system.

**4.1. Run-On/Run-Off Control**

Run-On/Run-Off control in the context of this plan refers to the non-contaminated precipitation at the site. In general, the site-wide run-off control will be managed in the same predominantly passive manner as during normal operations, utilizing the site grading, collection system and collection basins. This in-place system will be maintained during the closure period.

**4.1. Security/Inspection**

**4.2. Security**

**4.4.** Maintain security during final closure in accordance with the requirements of R315-8-2.5, Module II and Attachment II-2 of the RCRA permit.

**4.4.** Provide additional security measures during partial closure activities at the facility, as required by the Health and Safety Plan applicable to that closure activity.

**4.2. Inspections**

Conduct inspections in accordance with Module II and Attachment II-4 for waste management units still storing and/or managing waste except that:

**4.4.** The Permittee may cease conducting inspections for a storage and/or treatment unit that has been certified by an Independent, Utah Registered Professional

Engineer as being closed in accordance with this closure plan. The inspection form for that area may be so annotated until it is removed from the permit via a permit modification.

**4.4.** After waste is removed from a treatment and/or storage unit, emergency equipment specified in the contingency plan for that area is no long required to be present or maintained as long as work permits for these units are issued and include a list of emergency equipment required for the closure activities being performed.

**4.4.** During the closure of a unit, emergency equipment specified in the contingency plan may be replaced with different but equivalent equipment.

**4.4.** Record on the appropriate inspection form when closure activities or the status of the unit being closed preempt or negate the need for the standard inspection requirements.

**4.4.** Continue performing standard inspections that require looking for spills, leaks, abnormal conditions, etc. Where inspections aren't otherwise required, these inspections will be performed each day closure work is performed in an area.

### 4.1. Final/Partial Closure Application for Plan Approval

All closure activities require notification of the pending activity (and accompanying plan modifications) to reflect changed conditions, as appropriate. The application for plan approval of affected Closure activity must address required changes to all the major components outlined by this Site-Wide Closure Plan or any unit-specific closure plan. As discussed throughout, this may include, for example, the closure schedule, engineering requirements, groundwater monitoring and/or other ancillary closure activities.

## 10. SURVEY PLAT

No later than the submission of the certification of closure of each hazardous waste disposal unit or facility, the Permittee will file with Tooele County and submit to the Executive Secretary a survey plat indicating the location and dimensions of the closed landfill cells with respect to permanently surveyed benchmarks. This plat must be prepared and certified by a professional land surveyor. The plat filed with Tooele County must contain a note prominently displayed, which states the owner's or operators obligation to restrict disturbance of the hazardous waste disposal unit in accordance with the applicable post-closure requirements.

## 11. CLOSURE CERTIFICATION

Submit within 60 days of completion of closure of a waste management unit or the facility by registered mail or other proof of delivery, certification that the facility has been closed in accordance with the specifications in the approved closure plan, Attachment II-7. An independent, registered professional engineer qualified by experience and education in the appropriate engineering field must sign the certification.

## 12. COMPLETE UNIT AND FINAL FACILITY CLOSURE SCHEDULE

Disposal unit closure plan applications for plan approval will include a schedule of the closure activities. This will include the total time expected for complete closure of the unit and the time period required for complete removal of any inventory to assure compliance with 40 CF'R 264.113, as referenced by R315-8-7. Complete closure of a storage and/or treatment unit will be conducted in accordance with the schedule presented in Table D unless a request for an alternate schedule is requested of the Division.

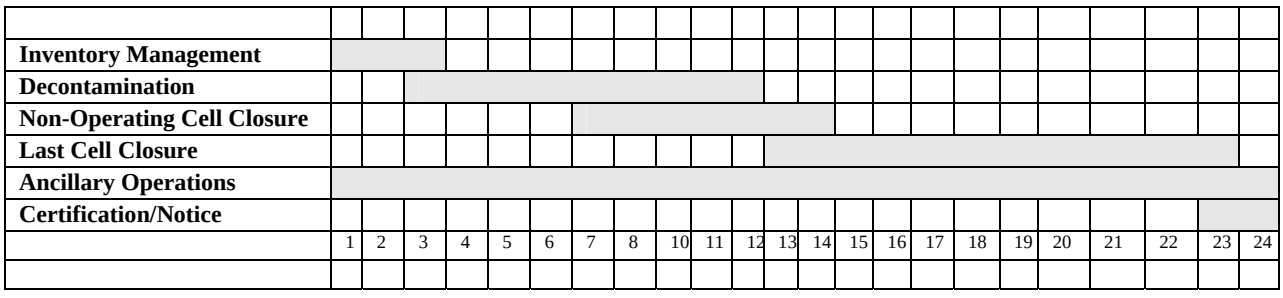
The final facility closure schedule presented in Table D, "Site Wide Closure Schedule," depicts a reasonable projection of closure activities based on conditions currently anticipated within the scope of this plan. This schedule presents the more critical “milestone" projections to allow for tracking of the progress of closure and to define the length of time closure will take.

The time frame established begins with the actual closure effort, assuming sixty (60) day notification of closure and initiation of work within thirty (30) days of receipt of the last waste. The submittal of final closure certification and filing the survey plat with the local land authority within sixty (60) days of completion are depicted by the last two months. The ninety (90) day requirement for complete waste inventory management is also depicted.

The projected completion of final site wide facility closure is anticipated to take longer than the 180 day requirement of 40 CFR 264.113 (b). The schedule projected in Table D, "Site Wide Closure Schedule," presents a minimum 24-month schedule based on the size and complexity of the current overall operation. The schedule also considers a hypothetical initiation month of September, which is restrictive due to possible slowing of work due to winter weather. The maximum extent of operations predicts that two landfill cells will be operational prior to final site wide closure. However, this closure plan and respective closure cost estimate acknowledges that currently three RCRA landfill cells are operational. Since these units require extensive efforts for closure governed by construction quality assurance issues that require efforts and physical conditions that are restricted during 4-5 months of the winter season, the final facility closure will, of necessity, require more than the statutory 180 days to complete.

During this extended time frame, as well as throughout the closure period, the Permittee will continue to take all steps to prevent threats to human health and the environment from the unclosed non-operating portions of the facility. This effort is supported by the requirements to continue all monitoring and maintenance of the facility in accordance with the permit throughout the closure period.

**Table D: Site Wide Closure Schedule (Elapsed Time in Months)**



## 13. CONTINGENT CLOSURE REQUIREMENTS

There are no units located at the facility subject to the contingent closure plan requirements in accordance with the R315-8-11.5 and this closure plan. If, at the time of closure of Surface Impoundment A, unexpected conditions are found which prevent closure in accordance with the above requirements, an amendment to the closure plan shall be necessary in accordance with R315-8-7 [40 CFR 264.112(c)(3)].

## 14. FINANCIAL REQUIREMENTS FOR CLOSURE

The closure cost estimate presented herein reflects the requirements of R315-8-8 and 40 CFR Part 264, Subpart H - Financial Requirements. More specifically, this section reflects the necessary modifications to respond to 40 CFR 264.142(c). The following cost estimate reflects the closure costs for the container management facility as a separate closure effort. The subsequent section addresses the general site wide closure, including the container management facility. Since closure of the container management facility will likely occur at the time of site wide closure, the certification costs would be redundant and have been subtracted from the site wide closure. The individual unit-specific Container Management Facility (CMF) Cost Worksheet Tables (CMF Worksheets 1-4) are followed by the site wide closure (CLO) Worksheet Tables (CLO Worksheets 1-7). The Cost Documentation Appendix (CDA, Appendix 1) includes discussion and analysis of estimated costs. The Cost Documentation Appendix, together with the Closure Cost Worksheets, provide appropriate documentation and references concerning the details of the estimate to allow the reviewer to evaluate their accuracy and appropriateness.

### 4.1. Closure Cost Estimate Support Information

The Closure Cost Worksheets provide the information utilized to develop the cost estimates provided below. Additional details of the estimates and references are provided in Appendix 1, "Cost Documentation Appendix (CDA)." The CDA is outlined to follow the Worksheets, mostly in order.

### 4.1. Container Management Facility Closure Cost Worksheets

The following Closure Cost Worksheets (CMF Worksheets 1-4) provide the information utilized to develop the Container Management Facility (CMF) Closure Cost Estimate. The Container Management Facility Closure Cost Estimate follows these Worksheets.

### 4.1. Site-Wide Closure Cost Estimate Support Information

The following Closure Cost Worksheets (Worksheets CLO 1-7) provide the information utilized to develop the site-wide Closure Cost Estimate. The site-wide Closure Cost Estimate follows these Worksheets.

## Worksheet CMF-1: Inventory Management

| | | |
|---|---|---|
| **1.** | **CONTAINER INVENTORY (Maximum in 55-Gallon Equivalents)** | |
| a. | Total number of containers categorized as flammable.<br>(From Table A, TD01 in 55-Gallon Equivalents) | 342 |
| b. | Total number of containers in the other storage areas.<br>(From Table A, Pad 2, TD02, SPAD in 55-Gallon Equivalents) | 1,960 |
| c. | Maximum inventory of containerized flammable waste for off-site management/incineration.<br>(From 1a) | 342 |
| d. | Maximum inventory of containerized flammable waste for off-site management/incineration.<br>(10% of 1b) | 196 |
| e. | Maximum inventory of off-site management/incineration waste.<br>(1c + 1d) | 538 |
| f. | Maximum inventory of containerized on-site management waste.<br>(1b 1d) | 1,764 |
| g. | Maximum inventory of Bulk Solids Transport Containers On-Site.<br>(Cubic Yards) | 2,000 |
| h. | Maximum inventory of Bulk Solids after treatment.<br>(1g x 1.6) | 3,200 |
| **2.** | **RE-CONTAINERIZATION OF WASTE** | |
| a. | Number of damaged containers that may require overpacking or other modified packaging.<br>(See CDA) | 69 |
| b. | Re-containerization Unit Cost<br>(See CDA) ($/Container) | $200 |
| c. | **TOTAL RE-CONTAINERIZATION COST [2a x 2b]:** | **$13,800** |
| **3.** | **CONTAINER MOBILIZATION** | |
| a. | Number of pallets to be loaded for off-site management transport.<br>(1e x 0.25) | 135 |
| b. | Number of pallets to be loaded for on-site disposal/transport.<br>(1f x 0.25) | 441 |
| c. | Mobilization Unit Cost.<br>(See CDA) ($/Pallet) | $13.90 |
| d. | **TOTAL CONTAINER MOBILIZATION COST [(3a+3b) x 3c]:** | **$8,006** |
| **4.** | **OFF-SITE MANAGEMENT OF INVENTORY** | |
| a. | Quantity of containers to be managed off-site:<br>(1e) | 538 |
| b. | Truck capacity:<br>(Number of 55-gallon equivalents per truck.) | 80 |
| c. | Number of loads:<br>(4a / 4b) (Partial shipments are invoiced as though a full shipment.) | 6.725<br>(7) |
| d. | Transportation Cost:<br>($/Load to Aragonite) | $300 |
| e. | Estimated Transportation Cost:<br>(4c x 4d) | $2,100 |
| f. | Off-site incineration costs:<br>(See CDA) ($/55-Gallon Equivalent) | $250 |
| g. | Total Estimated Off-Site Incineration Costs<br>(4a x 4f) | $134,500 |
| h. | **TOTAL ESTIMATED OFF-SITE MANAGEMENT COSTS [4e + 4g]:** | **$136,600** |

| | | |
|---|---|---|
| **5.** | **ON-SITE TREATMENT/DISPOSAL OF CONTAINER MANAGEMENT FACILITY "OTHER" INVENTORY AND BULK SOLIDS STORAGE AREA** | |
| a. | Quantity of containers to be treated on-site by stabilization prior to disposal:<br>(0.40 x 1f) | 705.6 |
| b. | Unit cost of stabilization followed by landfill disposal:<br>(See CDA) ($/Container) | $155.89 |
| c. | Total estimated cost for on-site treatment (stabilization) of container inventory:<br>(5a x 5b) | **$109,996** |
| d. | Quantity of containers designated for direct landfill disposal:<br>(0.60 x 1f) = number of containers | 1058.4 |
| e. | Unit cost for direct landfill disposal of containers:<br>(See CDA) ($/Container) | $3.68 |
| f. | Total estimated cost for direct landfill disposal of container inventory:<br>(5d x 5e) | **$3,895** |
| g. | Unit cost of bulk inventory stabilization/treatment:<br>(See CDA) ($/Cubic Yard) | $180 |
| h. | Unit cost of bulk inventory direct landfill disposal:<br>(See CDA) ($/Cubic Yard) | $13.51 |
| i. | Estimated cost of stabilization/treatment of bulk solids:<br>(BSSA) (1g x 5g) | **$360,000** |
| j. | Estimated cost of landfill disposal of bulk solids after treatment:<br>(BSSA) (1h x 5h) | **$43,246** |
| k. | **TOTAL ESTIMATED COST OF ON-SITE MANAGEMENT (5c + 5f + 5i + 5j):** | **$517,137** |
| **6.** | **SURFACE IMPOUNDMENT SOLIDS MANAGEMENT** | |
| a. | Thickness of solids remaining in surface impoundment at time of closure:<br>(Feet) | 1.5 |
| b. | Surface area of surface impoundment:<br>(See CDA) (Square Feet) | 50,976 |
| c. | Total estimated volume for disposal:<br>[(6a x 6b)/27] (Cubic Yards) | 2,832 |
| d. | Unit cost for direct landfill disposal:<br>(See CDA) ($/Cubic Yard) | $13.51 |
| f. | **TOTAL ESTIMATED COST FOR ON-SITE MANAGEMENT (6c + 6d):** | **$38,260** |
| **7.** | **TOTAL LANDFILL CAPACITY ASSURANCE REQUIRED** | |
| a. | Treated <u>container</u> inventory "on-site disposal" volume estimate:<br>(See CDA for Landfill Capacity Assurance) (Cubic Yards) {[(5a x 1.6) + 5d] x 0.27} | 591 |
| b. | Untreated container inventory "on-site disposal" volume estimate:<br>(See CDA for Landfill Capacity Assurance) (Containers) (5d)<br>1058 containers x 26 cubic feet/container/27 = cubic yards required for untreated containerized waste | 1,019 |
| c. | Treated <u>bulk</u> inventory "on-site disposal" volume estimate:<br>(See CDA for Landfill Capacity Assurance) (Cubic Yards) (1h) | 3,201 |
| d. | Untreated surface impoundment "on-site disposal" volume estimate:<br>(See CDA for Landfill Capacity Assurance) (Cubic Yards) (6c) | 2,832 |
| e. | **TOTAL LANDFILL CAPACITY ASSURANCE REQUIRED (Cubic Yards) [7a + 7b + 7c + 7d]:** | **7,643** |

## Worksheet CMF-2: Facility Decontamination

| | | |
|---|---|---|
| **1.** | **PROTECTIVE AND SAFETY EQUIPMENT FOR PERSONNEL** | |
| a. | Number of personnel requiring safety equipment for decontamination: | 34 |
| b. | Equipment cost:<br>($/person) | $360.75 |
| c. | **TOTAL COST OF PERSONNEL SAFETY EQUIPMENT (1a x 1b):** | **$12,266** |
| **2.** | **EQUIPMENT DECONTAMINATION** | |
| a. | Since these units will close during final facility closure, the costs attributable to this category are included in the site-wide closure cost estimate:<br>(See CDA) | N/A |
| **3.** | **CONTAINER MANAGEMENT FACILITY STRUCTURE DECONTAMINATION** | |
| a. | Area of pad and building interior to be decontaminated:<br>(See CDA) (Square Feet) | 46,511 |
| b. | Structure decontamination unit cost-initial wash-down:<br>(See CDA) ($/Square Feet) | $2.11 |
| c. | Structure decontamination unit cost-final wash-down:<br>(See CDA) ($/Square Feet) | $1.26 |
| d. | **TOTAL CONTAINER MOBILIZATION COST [(3a+3b) x 3c]:** | **$156,742** |
| **4.** | **ON-SITE TREATMENT/DISPOSAL OF DECONTAMINATION RESIDUALS** | |
| a. | Residual generation rate for initial wash-down of container management facility:<br>(See CDA) (Gallons/Square Feet) | 1.6 |
| b. | Residual generation rate for final wash-down of container management facility:<br>(See CDA) (Gallons/Square Feet) | 1.0 |
| c. | Quantity of aqueous residuals to be treated:<br>(Gallons) [(4a + 4b) x 3a)] | 120,929 |
| d. | Unit cost of transportation to L.A. Service Facility for aqueous treatment and discharge:<br>(See CDA) | 0.76 |
| e. | Estimated cost of aqueous residual treatment:<br>(4c x 4d) | **$91,906** |
| f. | Quantity of solid residuals from decontamination to be stabilized:<br>(See CDA) (Cubic Yards) | 19 |
| g. | Unit cost of stabilization:<br>(See CDA) ($/Cubic Yard) | $180 |
| h. | Estimated cost of solids residual treatment:<br>(4f x 4g) | **$3,420** |
| i. | Unit cost of on-site landfill disposal of bulk solids:<br>(See CDA) ($/Cubic Yard) | $13.51 |
| j. | Estimated volume of treated residuals:<br>(See CDA) (Cubic Yards) (4f x 1.6) | 30.4 |
| k. | Estimated cost of on-site landfill disposal of bulk solids:<br>(4i x 4j) | **$410** |
| l. | Quantity of soils to be removed adjacent to container management facility:<br>(See CDA) (Cubic Yards) | 80 |
| m. | Unit cost of soils removal:<br>(See CDA) ($/Cubic Yard) | $1.17 |
| n. | Estimated cost of landfill disposal of soils:<br>[4l x (4i + 4m)] | **$1,174** |
| o. | **TOTAL COST OF ON-SITE TREATMENT/DISPOSAL OF DECONTAMINATION RESIDUALS: (4e + 4h + 4k + 4n)** | **$96,910** |

| | | |
|---|---|---|
| p. | Decontamination residuals "on-site disposal" volume estimate:<br>(See CDA for Landfill Capacity Assurance) (Cubic Yards) (4l + 4j) | 110 |
| q. | **TOTAL LANDFILL CAPACITY ASSURANCE REQUIRED (Cubic Yards) [4p]:** | **110** |

## Worksheet CMF-3: Ancillary Closure Activities

| | | |
|---|---|---|
| **1.** | **SITE REGRADING** | |
| a. | Quantity of soils for regarding to compensate for removals:<br>(Cubic Yards) | 80 |
| b. | Cost of hauling, regarding and miscellaneous requirements:<br>(See CDA) ($/Cubic Yard) | $4.33 |
| c. | Total cost of site regarding:<br>(1a x 1b) | **$346** |
| **2.** | **SUMP TESTING** | |
| a. | Number of sumps within container management facility: | 5 |
| b. | Unit cost of hydrostatic testing of sumps:<br>(See CDA) ($/Sump) | $200 |
| c. | Total cost of hydrostatic testing of sumps:<br>(See CDA) ($/Sump) (2a x 2b) | **$1,000** |
| d. | **TOTAL COST OF ANCILLARY CLOSURE ACTIVITIES (1c + 2c):** | **$1,346** |

## Worksheet CMF-4: Closure Certification

| | | |
|---|---|---|
| **1.** | **SAMPLING AND ANALYSIS TO CONFIRM DECONTAMINATION** | |
| a. | Number of samples for confirmation of "clean" wash water:<br>(See CDA) | 6 |
| b. | Unit cost of liquid analysis:<br>(See CDA) ($/Sample) | $1,500 |
| c. | Total cost of liquid sample analysis for decontamination confirmation:<br>(1a x 1b) | **$9,000** |
| d. | Number of samples for soil decontamination confirmation:<br>(See CDA) | 20 |
| e. | Unit cost of soil/sludge analysis:<br>(See CDA) ($/Sample) | $2,800 |
| f. | Cost of soil/sludge sample analysis for decontamination confirmation:<br>(1e x 1d) | **$56,000** |
| g. | Number PCB samples for liquid analysis: | 10 |
| h. | Unit cost of liquid samples for PCB analysis:<br>(See CDA) ($/Sample) | $100 |
| i. | Cost of liquid sample analysis for decontamination confirmation:<br>(1g x 1h) | **$1,000** |
| j. | Number PCB samples for soil analysis: | 55 |
| k. | Unit cost of soil samples for PCB analysis:<br>(See CDA) ($/Sample) | $100 |
| l. | Cost of liquid sample analysis for decontamination confirmation:<br>(1g x 1h) | **$5,500** |
| m. | **TOTAL ESTIMATED ANALYTICAL COSTS FOR CMF CLOSURE (1d + 1g):** | **$71,500** |
| **2.** | **CERTIFICATION DOCUMENTS BY INDEPENDENT PROFESSIONAL ENGINEER** | |
| a. | Certification documents by independent Professional Engineer:<br>(See CDA) | $65,579 |
| m. | **TOTAL CERTIFICATION COSTS BY INDEPENDENT PE (2a):** | **$65,579** |

## Table E: Container Managment Facility and BSSA Closure Cost Estimate

| CONTAINER MANAGEMENT FACILITY AND BSSA CLOSURE COST ESTIMATE | | |
|---|---|---|
| Re-Containerization | (CMF-1) | $13,800 |
| Container Mobilization | (CMF-1) | $8,006 |
| Off-Site Management of Inventory | (CMF-1) | $136,600 |
| On-Site Management of Inventory | (CMF-1) | $517,137 |
| On-Site Management of Surface Impoundment Solids | (CMF-1) | $38,260 |
| Personnel Safety Equipment | (CMF-2) | $12,266 |
| Structure Decontamination | (CMF-2) | $156,742 |
| Treatment/Disposal of Decontamination Residuals | (CMF-2) | $96,910 |
| Ancillary Closure Activities | (CMF-3) | $1,346 |
| Certification Sampling Analytical Costs | (CMF-4) | $71,500 |
| Certification of Container Management Facility Closure | (CMF-4) | $65,579 |
| **SUBTOTAL ESTIMATED CMF & BSSA CLOSURE COST:** | | **$1,118,146** |
| Administrative and Contingency Costs (10%) | | **$111,815** |
| **TOTAL ESTIMATED (2001 $'s) OF CMF AND BSSA CLOSURE COSTS:** | | **$1,229,961** |

## Worksheet CLO-1: Inventory Management of Hazardous Waste Treatment/Storage/Process Units

| | | |
|---|---|---|
| **1.** | **CONTAINER MANAGEMENT UNIT INVENTORY** | |
| a. | See previous Worksheets CMF-1 through CMF-4 | N/A |
| **2.** | **CURRENT MAXIMUM FACILITY TANK SYSTEM INVENTORY** | |
| a. | Leachate Storage Volume:<br>(See Table A) (Gallons) | 65,000 |
| **3.** | **PUT-PILE INVENTORY** | |
| a. | Maximum inventory of put piles: | 250 |
| b. | Average unit cost to analyze:<br>(See CDA) | $250 |
| c. | Total cost to initially analyze put piles:<br>(See CDA) (3a x 3b) | **$62,500** |
| d. | Average failure rate of put pile treatment:<br>(Fraction of Piles) | 0.03 |
| e. | Number of put piles that must be retreated:<br>(3a x 3d) | 7.5 |
| f. | Volume of expansion due to retreatment:<br>(Factor) | 1.3 |
| g. | Average size of each put pile:<br>(Cubic Yards) | 45 |
| h. | Total Yards Requiring Retreatment:<br>(Cubic Yards) (3e x 3f x 3g) | 439 |
| i. | Unit cost to retreat, analyze and move put piles:<br>($/Cubic Yard) | $180 |
| j. | Total cost to retreat failed put piles:<br>(3h x 3i) | **$79,020** |
| k. | Unit cost to move failed put piles:<br>($/Cubic Yard) | $2 |
| l. | Total cost to move failed put piles:<br>(3h x 3k) | **$878** |
| m. | Cost to re-analyze re-treated put piles:<br>(3e x 3b) | **$1,875** |
| n. | **TOTAL COST TO INITIALLY ANALYZE, RETREAT, MOVE PUT PILES ($) (3c + 3j +3l + 3m):** | **$144,273** |
| o. | Put-pile volume estimate, treatment successful on first time:<br>(See CDA for Landfill Capacity Assurance) (Cubic Yards) [3a x 3g x (1-3d)] | 10,912 |
| p. | Put-pile volume estimate, treatment not successful on first time:<br>(See CDA for Landfill Capacity Assurance) (Cubic Yards) [3h x 1.6] | 571 |
| q. | **TOTAL LANDFILL CAPACITY ASSURANCE REQUIRED (Cubic Yards) [3o + 3p]:** | **11,483** |
| **4.** | **LEACHATE INVENTORY MANAGEMENT** | |
| a. | Maximum hazardous waste inventory for off-site treatment:<br>(Gallons) (2a) | 65,000 |
| b. | Unit cost of bulk liquid treatment off-site, includes mobilization:<br>(See CDA) ($/Gallon) | $0.76 |
| c. | **TOTAL ESTIMATED OFF-SITE MANAGEMENT COSTS (4a x 4b):** | **$49,400** |
| | | |
| | **TOTAL ESTIMATED INVENTORY MANAGEMENT (3n + 4c):** | **$193,673** |

## Worksheet CLO-2: Hazardous Waste Management Unit (HWMU) Decontamination

| | | |
|---|---|---|
| **1.** | **PROTECTIVE AND SAFETY EQUIPMENT FOR PERSONNEL** | |
| a. | Number of personnel requiring safety equipment for decontamination:<br>(See CDA) | 34 |
| b. | Initial equipment cost per person:<br>(See CDA) | $361 |
| c. | Total initial equipment cost:<br>(1a x 1b) | **$12,274** |
| d. | Renewing equipment cost per person per day:<br>(See CDA) | $18 |
| e. | Number of closure days:<br>(See CDA) | 416 |
| f. | Total renewing equipment cost:<br>(1a x 1d x 1e) | **$247,520** |
| g. | **TOTAL COST OF PERSONNEL SAFETY EQUIPMENT [1a + 1g)]:** | **$259,794** |
| **2.** | **CONTAINER MANAGEMENT FACILITY** | |
| a. | See Appendix No. 2.2 (Closure Costs for Container Management Facility are included in Section III – Financial Requirements for Closure). | N/A |
| **3.** | **WASTEWATER TREATMENT TANK SYSTEM** | |
| a. | Caustic storage area to be decontaminated:<br>(See CDA) (Square Feet) | 6,400 |
| b. | Acid storage area to be decontaminated:<br>(See CDA) (Square Feet) | 5,213 |
| c. | Treated liquid storage area to be decontaminated:<br>(See CDA) (Square Feet) | 3,364 |
| d. | Total HWMU area to be decontaminated:<br>(3a + 3b + 3c) | 14,977 |
| e. | Unit cost for initial decontamination wash-down:<br>(See CDA) ($/Square Feet) | $2.11 |
| f. | Unit cost for final decontamination wash-down:<br>(See CDA) ($/Square Feet) | $1.26 |
| g. | **TOTAL HWMU DECONTAMINATION COST [3d x (3e + 3f)]:** | **$50,472** |
| **4.** | **STABILIZATION TANK SYSTEM** | |
| a. | Containment area to be decontaminated:<br>(See CDA) (Square Feet) | 7,825 |
| b. | Tank and equipment area to be decontaminated:<br>(See CDA) (Square Feet) | 6,480 |
| c. | Total HWMU area to be decontaminated:<br>(4a + 4b) | 14,305 |
| d. | Unit cost for initial decontamination wash-down:<br>(See CDA) ($/Square Feet) | $2.11 |
| e. | Unit cost for final decontamination wash-down:<br>(See CDA) ($/Square Feet) | $1.26 |
| f. | Total cost for stabilization tank system decontamination:<br>[4c x (4d + 4e)] | **$48,208** |
| g. | Number PCB samples for liquid analysis: | 5 |
| h. | Unit cost of liquid samples for PCB analysis:<br>(See CDA) ($/Sample) | $100 |
| i. | Total cost of liquid sample analysis for decontamination confirmation:<br>(4g x 4h) | **$500** |

| | | |
|---|---|---|
| j. | Number PCB samples for soil analysis: | 20 |
| k. | Unit cost of soil samples for PCB analysis:<br>(See CDA) ($/Sample) | $100 |
| l. | Total cost of liquid sample analysis for decontamination confirmation:<br>(4j x 4k) | **$2,000** |
| m. | Dismantling/demolition costs for one stabilization tank assuming it leaked:<br>(See CDA) | $1,904 |
| n. | Number of stabilization tanks to be dismantled: | 3 |
| o. | Total cost for dismantling/demolition of stabilization tanks:<br>(4m x 4n) | **$5,712** |
| p. | **TOTAL HWMU DECONTAMINATION COST [4f + 4i + 4l + 4o]:** | **$56,420** |
| **5. WASTE SOLVENT TANK SYSTEM** | | |
| a. | Containment structure area to be decontaminated:<br>(See CDA) (Square Feet) | 1,557 |
| b. | Tank and equipment area to be decontaminated:<br>(See CDA) (Square Feet) | 4,088 |
| c. | Total HWMU area to be decontaminated:<br>(4a + 4b) | 5,645 |
| d. | Unit cost for initial decontamination wash-down:<br>(See CDA) ($/Square Feet) | $2.11 |
| e. | Unit cost for final decontamination wash-down:<br>(See CDA) ($/Square Feet) | $1.26 |
| f. | **TOTAL HWMU DECONTAMINATION COST [(5c x (5d + 5e)]:** | **$19,024** |
| **6. LEACHATE TREATMENT TANK SYSTEM** | | |
| a. | Tank and equipment area to be decontaminated:<br>(See CDA) (Square Feet) | 7,035 |
| b. | Unit cost for initial decontamination wash-down:<br>(See CDA) ($/Square Feet) | $2.11 |
| c. | Unit cost for final decontamination wash-down:<br>(See CDA) ($/Square Feet) | $1.26 |
| d. | Total cost for leachate tank system decontamination:<br>[6a x (6b + 6c)] | **$23,708** |
| e. | Number of PCB Samples for liquid analysis: | 5 |
| f. | Unit cost of liquid samples for PCB analysis:<br>(See CDA) ($/Sample) | $100 |
| g. | Cost of liquid sample analysis for decontamination confirmation:<br>(6e x 6f) | **$500** |
| h. | Number of PCB samples for soil analysis: | 20 |
| i. | Unit cost of soil samples for PCB analysis:<br>(See CDA) ($/Sample) | $100 |
| j. | Cost of liquid sample analysis for decontamination confirmation:<br>(6h x 6i) | **$2,000** |
| k. | **TOTAL HWMU DECONTAMINATION COST [6d + 6g + 6j]:** | **$26,208** |
| **7. SURFACE IMPOUNDMENT UNIT** | | |
| a. | Containment liner area to be decontaminated:<br>(See CDA) (Square Feet) | 50,976 |
| b. | Unit cost for initial decontamination wash-down:<br>(See CDA) ($/Square Feet) | $2.11 |
| c. | Total wash-down decontamination:<br>(7a x 7b) | **$107,559** |

| | | |
|---|---|---|
| d. | Quantity of liner and leak detection media removal:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) | 821 |
| e. | Unit cost for liner components removal:<br>(See CDA) ($/Cubic Yard) | $8.49 |
| f. | Total cost of liner component removal:<br>(7d x 7e) | **$6,970** |
| g. | Quantity of clay liner for removal:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) | 1,556 |
| h. | Unit cost of clay liner removal:<br>(See CDA) ($/Cubic Yard) | 1.17 |
| i. | Total cost of clay liner removal:<br>(7g x 7h) | **$1,820** |
| j. | **TOTAL HWMU DECONTAMINATION COST (7c + 7f + 7i):** | **$116,349** |
| | | |
| | **TOTAL FACILITY HWMU DECONTAMINATION COST (1g + 3g + 4p + 5f + 6k + 7j):** | **$528,267** |

## Worksheet CLO-3: Treatment and Disposal of Decontamination Residuals

| | | |
|---|---|---|
| **1.** | **CONTAINER MANAGEMENT FACILITY** | |
| a. | See Condition No. 14.2, CMF Closure Cost Worksheets | N/A |
| **2.** | **WASTEWATER TREATMENT TANK SYSTEMS** | |
| a. | Residual generation rate of initial decontamination wash-down of unit:<br>(See CDA) (Gallons/Square Feet) | 1.6 |
| b. | Residual generation rate of final decontamination wash-down of unit:<br>(See CDA) (Gallons/Square Feet) | 1.0 |
| c. | Quantity of residuals to be treated:<br>(Gallons) [(2a + 2b) x 3d{from CLO-2}] | 38,940 |
| d. | Unit cost of off-site transportation and management at treatment facility with NPDES permit:<br>(See CDA) ($/Gallon) | $0.76 |
| e. | Quantity of solid residuals from decontamination:<br>(See CDA) (Gallons) (2c x 0.05) | 1,947 |
| f. | Total estimated cost of off-site transportation and management at treatment facility with NPDES:<br>[2c – 2e) x 2d] | **$28,215** |
| g. | Quantity of decontamination residuals to be stabilized prior to disposal:<br>(See CDA) (2e converted from gallons to cubic yards) (2e/55 x 0.27) (Cubic Yards) | 9.6 |
| h. | Unit cost of bulk stabilization for residuals:<br>(See CDA) ($/Cubic Yard) | $180 |
| i. | Total cost of stabilization for landfill disposal of residuals:<br>(2g x 2h) | **$1,728** |
| j. | Estimated volume of treated decontamination residuals:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) [2g x 1.6] | 15.4 |
| k. | Unit cost of on-site landfill disposal of bulk solids:<br>(See CDA) ($/Cubic Yard) | $13.51 |
| l. | Total cost of on-site landfill disposal of stabilized residuals:<br>(2j x 2k) | **$208** |
| m. | Quantity of soils removed for area decontamination:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) | 35 |
| n. | Unit cost of soils removal:<br>(See CDA) ($/Cubic Yard) | $1.17 |
| o. | Total cost of soils removal:<br>(2m x 2n) | **$41** |
| p. | Total cost of on-site disposal of soils residuals:<br>(2m x 2k) | **$473** |
| q. | **TOTAL COST OF TREATMENT/DISPOSAL OF DECON RESIDUALS (2f + 2i + 2l + 2o + 2p):** | **$30,665** |
| r. | Decontamination residuals “on-site disposal” volume estimate:<br>(See CDA for Landfill Capacity Assurance) (Cubic Yards) | 15.4 |
| s. | **TOTAL LANDFILL CAPACITY ASSURANCE REQUIRED (Cubic Yards) [2r]:** | **15.4** |
| **3.** | **STABILIZATION TANK SYSTEM** | |
| a. | Residual generation rate of initial decontamination wash-down of unit:<br>(See CDA) (Gallons/Square Feet) | 1.6 |
| b. | Residual generation rate of final decontamination wash-down of unit:<br>(See CDA) (Gallons/Square Feet) | 1.0 |
| c. | Quantity of residuals to be treated off-site:<br>[(3a + 3b) x 4c{from CLO-2}] (Gallons) | 37,193 |
| d. | Unit cost of off-site transportation and management at treatment facility with NPDES permit:<br>(See CDA) ($/Gallon) | $0.76 |
| e. | Quantity of solid residuals from decontamination:<br>(See CDA) ($/Gallon) (3c x 0.05) | 1,860 |

| | | |
|---|---|---|
| f. | Total estimated cost of off-site transportation and management at treatment facility with NPDES:<br>[(3c – 3e) x 3d] | **$26,853** |
| g. | Quantity of decontamination residuals to be stabilized prior to disposal:<br>(See CDA) (3e converted from gallons to cubic yards) (3e/55 x 0.27) | 9 |
| h. | Unit cost of bulk stabilization for residuals:<br>(See CDA) ($/Cubic Yard) | $180 |
| i. | Total cost of stabilization for landfill disposal of residuals:<br>(3g x 3h) | **$1,620** |
| j. | Estimated volume of treated decontamination residuals:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) [3g x 1.6] | 14 |
| k. | Unit cost of on-site landfill disposal of bulk solids:<br>(See CDA) ($/Cubic Yard) | $13.51 |
| l. | Total cost of on-site landfill disposal of stabilized residuals:<br>(3j x 3k) | **$189** |
| m. | Quantity of soils removed for area decontamination:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) | 70 |
| n. | Unit cost of soils removal:<br>(See CDA) ($/Cubic Yard) | $1.17 |
| o. | Total cost of soils removal:<br>(3m x 3n) | **$82** |
| p. | Total cost of on-site disposal of soils residuals:<br>(3m x 3k) | **$946** |
| q. | **TOTAL COST OF TREATMENT/DISPOSAL OF DECON RESIDUES (3f + 3i + 3l + 3o + 3p):** | **$29,690** |
| r. | Decontamination residuals "on-site disposal" volume estimate:<br>(See CDA for Landfill Capacity Assurance) (Cubic Yards) (3j + 3m) | 84 |
| s. | **TOTAL LANDFILL CAPACITY ASSURANCE REQUIRED (Cubic Yards) [3r]:** | **84** |
| **4.** | **WASTE SOLVENT TANK SYSTEM** | |
| a. | Residual generation rate of initial decontamination wash-down of unit:<br>(See CDA) (Gallons/Square Feet) | 1.6 |
| b. | Residual generation rate of final decontamination wash-down of unit:<br>(See CDA) (Gallons/Square Feet) | 1.0 |
| c. | Quantity of residuals to be treated:<br>(Gallons) [(4a + 4b) x 5c{from CLO-2}] | 14,677 |
| d. | Unit cost of off-site transportation and management at treatment facility with NPDES permit:<br>(See CDA) ($/Gallon) | $0.76 |
| e. | Quantity of solid residuals from decontamination:<br>(See CDA) (Gallons) (4c x 0.05) | 734 |
| f. | Total estimated cost of off-site transportation and management at treatment facility with NPDES:<br>[(4c – 4e) x 4d] | **$10,597** |
| g. | Quantity of decontamination residuals to be stabilized prior to disposal:<br>(See CDA) (4e converted from gallons cubic yards) (4e/55 x 0.27) | 3.6 |
| h. | Unit cost of bulk stabilization for residuals:<br>(See CDA) ($/Cubic Yard) | $180 |
| i. | Total cost of stabilization for landfill disposal of residuals:<br>(4g x 4h) | **$648** |
| j. | Estimated volume of treated decontamination residuals:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) [4g x 1.6] | 5.8 |
| k. | Unit cost of on-site landfill disposal of bulk solids:<br>(See CDA) ($/Cubic Yard) | $13.51 |
| l. | Total cost of on-site landfill disposal of stabilized residuals:<br>(4j x 4k) | **$78** |
| m. | Quantity of soils removed for area decontamination:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) | 15 |
| n. | Unit cost of soils removal:<br>(See CDA) ($/Cubic Yard) | $1.17 |

| | | |
|---|---|---|
| o. | Total cost of soils removal:<br>(4m x 4n) | **$18** |
| p. | Total cost of on-site disposal of soils residuals:<br>(4m x 4k) | **$203** |
| q. | **TOTAL COST OF TREATMENT/DISPOSAL OF DECON RESIDUALS (4f + 4i + 4l + 4o + 4p):** | **$11,544** |
| r. | Decontamination residuals "on-site disposal" volume estimate:<br>(See CDA for Landfill Capacity Assurance) (Cubic Yards) (4j + 4m) | 20.8 |
| s. | **TOTAL LANDFILL CAPACITY ASSURANCE REQUIRED (Cubic Yards) [4r]:** | **20.8** |
| **5.** | **LEACHATE TANK SYSTEM** | |
| a. | Residual generation rate of initial decontamination wash-down of unit:<br>(See CDA) (Gallons/Square Feet) | 1.6 |
| b. | Residual generation rate of final decontamination wash-down of unit:<br>(See CDA) (Gallons/Square Feet) | 1.0 |
| c. | Quantity of residuals to be treated:<br>(Gallons) [(5a + 5 b) x 6a{from CLO-2}] | 18,291 |
| d. | Unit cost of off-site transportation and management at treatment facility with NPDES permit:<br>(See CDA) ($/Gallon) | $0.76 |
| e. | Quantity of solid residuals from decontamination:<br>(See CDA) (Gallons) (5c x 0.05) | 915 |
| f. | Total estimated cost of off-site transportation and management at treatment facility with NPDES:<br>[(5c – 5e) x 5d] | **$13,206** |
| g. | Quantity of decontamination residuals to be stabilized prior to disposal:<br>(See CDA) (5e converted from gallons to cubic yards) (5e/55 x 0.27) | 4.5 |
| h. | Unit cost of bulk stabilization for residuals:<br>(See CDA) ($/Cubic Yard) | $180 |
| i. | Total cost of stabilization for landfill disposal of residuals:<br>(5g x 5h) | **$810** |
| j. | Estimated volume of treated decontamination residuals:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) (5g x 1.6) | 7.2 |
| k. | Unit cost of on-site landfill disposal of bulk solids:<br>($/cubic yard) (see CDA) | $13.51 |
| l. | Total cost of on-site landfill disposal of stabilized residuals:<br>(4j x 4k) | **$97** |
| m. | Quantity of soils removed for area decontamination:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) | 30 |
| n. | Unit cost of soils removal:<br>(See CDA) ($/Cubic Yard) | $1.17 |
| o. | Total cost of soils removal:<br>(5m x 5n) | **$35** |
| p. | Total cost of on-site landfill disposal of stabilized residuals:<br>(5m x 5k) | **$405** |
| q. | **TOTAL COST OF TREATMENT/DISPOSAL OF DECON RESIDUALS (5f + 5i + 5l + 5o + 5p):** | **$14,553** |
| p. | Decontamination residuals "on-site disposal" volume estimate:<br>(See CDA for Landfill Capacity Assurance) (Cubic Yards) (5j + 5m) | 37.2 |
| q. | **TOTAL LANDFILL CAPACITY ASSURANCE REQUIRED (Cubic Yards) [5p]:** | **37.2** |
| **6.** | **SURFACE IMPOUNDMENT UNIT A** | |
| a. | Residual generation rate of initial decontamination wash-down of unit:<br>(See CDA) (Gallons/Square Feet) | 1.6 |
| b. | Quantity of aqueous residuals to be treated:<br>(Gallons) [(6a x 7a{from CLO-2}) | 81,562 |
| c. | Unit cost of off-site transportation and management at treatment facility with NPDES permit:<br>(See CDA) ($/Gallon) | $0.76 |

| | | |
|---|---|---|
| d. | Quantity of solid residuals from decontamination:<br>(See CDA) (Gallons) (6b x 0.05) | 4,078 |
| e. | Total estimated cost of off-site transportation and management at treatment facility with NPDES:<br>[(6b – 6d) x 6c] | **$58,888** |
| f. | Quantity of decontamination residuals to be stabilized prior to disposal:<br>(See CDA) (6d converted from gallons to cubic yards) (6d/55 x 0.27) | 20 |
| g. | Unit cost of bulk stabilization for residuals:<br>(See CDA) ($/Cubic Yard) | $180 |
| h. | Total cost of stabilization for landfill disposal of residuals:<br>(6f x 6g) | **$3,600** |
| i. | Estimated volume of treated decontamination residuals:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) [6d/55 x 0.27 x 1.6] | 32 |
| j. | Unit cost of on-site landfill disposal of bulk solids:<br>(See CDA) ($/Cubic Yard) | $13.51 |
| k. | Total cost of on-site landfill disposal of stabilized residuals:<br>(6i x 6j) | **$433** |
| l. | Quantity of liner component and leak detection media removed:<br>(See CDA) (Cubic Yards) (7d {from CLO-2}) | 821 |
| m. | Total cost of liner/leak detection media and land disposal:<br>(6l x 6j) | **$11,092** |
| n. | Quantity of clay liner/soils removed:<br>(See CDA) (Cubic Yards) (7g {from CLO-2}) | 1,556 |
| o. | Total cost of clay liner land disposal:<br>(6m x 6j) | **$21,022** |
| p. | **TOTAL COST OF TREATMENT/DISPOSAL OF DECON RESIDUALS [6e + 6h + 6m + 6o]:** | **$94,602** |
| p. | Decontamination residuals “on-site disposal” volume estimate:<br>(See CDA for Landfill Capacity Assurance) (Cubic Yards) (6i + 6l + 6n) | 2,409 |
| q. | **TOTAL LANDFILL CAPACITY ASSURANCE REQUIRED (Cubic Yards) [6p]:** | **2,409** |
| | | |
| | **TOTAL COST OF TREATMENT/DISPOSAL OF DECONTAMINATION RESIDUALS: [2q + 3q + 4q + 5q + 6p]** | **$181,054** |

## Worksheet CLO-4, Final Cover/Landfill Closure

| 1. FINAL COVER LANDFILL CLOSURE (BASED ON ACTUAL COSTS OF SIMILAR CLOSURE CAPS (SEE CDA) | | |
|---|---|---|
| a. | Cell 4 ~ (490 feet x 1,079 feet) (square feet) | $2,213,739 |
| b. | Cell 5 ~ (710 feet x 750 feet) (square feet) | $2,180,905 |
| c. | Cell 7 ~ (830 feet x 830 feet) (square feet) | $2,630,675 |
| d. | **TOTAL COST OF FINAL COVER/LANDFILL CLOSURE (1a + 1b + 1c):** | **$7,025,319** |

## Worksheet CLO-5, Groundwater Monitoring During Closure Activities

| 1. GROUNDWATER MONITORING – DETECTION MONITORING BACKGROUND & COMPLIANCE POINT | | |
|---|---|---|
| a. | Number of wells in HWMU monitoring system including 4 background wells:<br>(See CDA) | 55 |
| b. | Number of wells partially covered by TSCA sampling requirements for PCB, Volatile, Semi-Volatile and Class 3 parameters, including 2 background wells: | 23 |
| c. | Number of wells for full analysis including 2 background wells: | 32 |
| d. | Quantity of samples collected per well per sampling event:<br>(See CDA) (Samples/Well) | 1 |
| e. | Number of QA/QC duplicate analyses per sampling event ½ covered by TSCA closure:<br>(See CDA) | 3 |
| f. | Number of field blank samples per sampling event:<br>(See CDA) (Includes one bottle blank. Balance covered by TSCA.) | 1.5 |
| g. | Number of field blank samples for volatile constituents per sampling event:<br>(See CDA) (Another 6 are done as part of the TSCA events.) | 6 |
| h. | Number of completed Class 1 and Class 3 analyses performed per event:<br>[1c + 1d + 1e + 1f] | 37.5 |
| i. | Cost per sample for complete Class 1 and Class 3 analysis: | $1,216 |
| j. | Total cost for completed Class 1 and Class 3 analysis:<br>(1h x 1i) | **$45,600** |
| k. | Number of samples without volatile, semi-volatile and Class 3 parameters: | 23 |
| l. | Cost per sample for Class 1 parameters less volatiles and semi-volatiles: | $436 |
| m. | Total cost for Class 1 parameters less volatiles and semi-volatiles:<br>(1k x 1l) | **$10,028** |
| n. | Unit cost of laboratory analysis for volatile field blanks:<br>(See CDA) ($/Sample) | **$134** |
| o. | Total analytical costs per sampling event for extra volatile samples:<br>(1g x 1n) | **$806** |
| p. | Shipping and data package costs:<br>(See CDA) | **$8,211** |
| q. | Total analytical costs per sampling event:<br>(1j + 1m + 1n + 1o + 1p) | **$64,775** |
| r. | Total cost for groundwater monitoring sampling, reporting, administration:<br>(See CDA) ($/Sampling Event) | **$53,967** |
| s. | Number of sampling events during closure:<br>(See CDA) | 4 |
| t. | Annual monitoring well maintenance costs: | **$603** |
| u. | **Total Groundwater Monitoring Costs During Closure [1s x (1q + 1r + 1t/2)]:** | **$475,318** |

## Worksheet CLO-6, Ancillary Closure Activities

| | | |
|---|---|---|
| **1.** | **LEACHATE MANAGEMENT** | |
| a. | Leachate pumping and transfer from landfill cells:<br>(See CDA) (Gallons/Day Averaged) | 1,317 |
| b. | Number of RCRA cells:<br>(Includes Industrial Waste Cells 1 and 2) | 8 |
| c. | Closure period expected for final closure is 2 years:<br>(Days) | 730 |
| d. | Leachate volume total:<br>(Gallons) (1a x 1c) | 961,410 |
| e. | Unit cost of leachate pumping and transfer:<br>(See CDA) ($/Gallon) | 0.09 |
| f. | Total cost of leachate pumping and transfer:<br>(1d x 1e) | **$86,527** |
| g. | Unit cost of off-site transportation and management at treatment facility with NPDES permit:<br>(See CDA) ($/Gallon) | 0.76 |
| h. | Quantity of solid residuals:<br>(See CDA) (Gallons) (1d x 0.05) | 48,071 |
| i. | Total estimated cost of off-site transportation and management at treatment facility:<br>[(1d – 1h) x 1g] | **$694,138** |
| j. | Quantity of leachate management residuals to be stabilized prior to disposal:<br>(See CDA) (1h converted from gallons to cubic yards) (1h/55 x 0.27) | 236 |
| k. | Unit cost of bulk stabilization for landfill disposal of treated leachate residuals:<br>(See CDA) ($/Cubic Yard) | $180 |
| l. | Total cost of stabilization of leachate residuals:<br>(1j x 1k) | **$42,480** |
| m. | Estimated volume of treated residuals:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) (1j x 1.6) | 377 |
| n. | Unit cost of on-site landfill disposal of bulk solids:<br>(See CDA) ($/Cubic Yard) | $13.51 |
| o. | Total cost of on-site landfill disposal of stabilized residuals:<br>(1m x 1n) | **$5,093** |
| p. | **TOTAL COST OF LEACHATE MANAGEMENT [1f + 1i + 1l + 1o]:** | **$828,238** |
| **2.** | **RUN-ON/RUN-OFF CONTROL MAINTENANCE** | |
| a. | Unit cost of maintenance crew:<br>(See CDA) ($/Day) | $960 |
| b. | Estimated days of maintenance during closure:<br>(See CDA) | 24 |
| c. | **TOTAL COST OF RUN-ON/RUN-OFF CONTROL MAINTENANCE (2a x 2b):** | **$23,040** |
| **3.** | **SECURITY/INSPECTION** | |
| a. | Personnel required for security during closure:<br>(See CDA) (Hours/Day) | 24 |
| b. | Duration of period requiring security during closure:<br>(See CDA) (Days) | 365 |
| c. | Unit cost of personnel for security:<br>(See CDA) ($/Hour) | $18 |
| d. | Fraction of security associated with RCRA closure: | 0.67 |
| e. | **TOTAL COST OF SECURITY DURING CLOSURE (3a x 3b x 3c x 3d):** | **$105,646** |
| **4.** | **MOBILIZATION/DEMOBILIZATION OF HEAVY EQUIPMENT** | |

| | | |
|---|---|---|
| a. | Mobilization/demobilization of six heavy pieces of equipment (see CDA) | **$9,000** |
| **5.** | **SITE REGRADING/RESTORATION** | |
| a. | Volume of soil disturbance for decontamination:<br>(See CDA) (Cubic Yards) | 200 |
| b. | Quantity of fill material (on-site) for regrading:<br>(See CDA) (Cubic Yards) | 200 |
| c. | Unit cost of fill material for regrading – excavation and haul:<br>(See CDA) ($/Cubic Yard) | $3.10 |
| d. | Total cost of fill material:<br>(5a x 5c) | **$620** |
| e. | Quantity of other site regrading:<br>(See CDA) (Cubic Yards) | 1,556 |
| f. | Unit cost of site regrading:<br>($/Cubic Yard) | $1.23 |
| g. | Total cost of regrading:<br>[(5b + 5e) x 5f] | **$2,160** |
| h. | **TOTAL COST OF SITE RESTORATION (5d + 5g):** | **$2,780** |
| **6.** | **SUMP TESTING** | |
| a. | Number of sumps affected: | 11 |
| b. | Unit cost of sump testing:<br>(See CDA) ($/Sump) | 200 |
| c. | **TOTAL COST OF SUMP TESTING (6a x 6b):** | **$2,200** |
| **7.** | **EQUIPMENT DECONTAMINATION (GENERAL)** | |
| a. | Number of units of equipment to be decontaminated:<br>(See CDA) | 42 |
| b. | Unit cost of decontamination:<br>($/Unit) | $1,686 |
| c. | Total cost of miscellaneous equipment decontamination:<br>(7a x 7b) | **$70,812** |
| d. | Decontamination residual generation rate:<br>(See CDA) (Gallons/Unit) | 1,300 |
| e. | Total decontamination residual generated:<br>(Gallons) (7a x 7d) | 54,600 |
| f. | Unit cost of off-site transportation and management at treatment facility with NPDES permit:<br>(See CDA) ($/Gallon) | $0.76 |
| g. | Total estimated cost of off-site transportation and management at treatment facility:<br>[(7e -7h) x 7f] | **$39,421** |
| h. | Quantity of solid residuals from decontamination:<br>(See CDA) (7e x 0.05) (Gallons) | 2,730 |
| i. | Quantity of decontamination residuals to be stabilized prior to disposal:<br>(See CDA) (4e converted from gallons to cubic yards) (7h/55 x 0.27) | 13.5 |
| j. | Unit cost of bulk stabilization for landfill disposal of treated leachate residuals:<br>(See CDA) ($/Cubic Yard) | $180 |
| k. | Total cost of stabilization of leachate residuals:<br>(7i x 7j) | **$2,430** |
| l. | Estimated volume of treated decontamination residuals:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) [(7g/55 x 0.27 x 1.6] | 21.6 |
| m. | Unit cost of on-site landfill disposal of bulk solids:<br>($/Cubic Yard) (See CDA) | $13.51 |
| n. | Total cost of on-site landfill disposal of stabilized residuals:<br>(7l x 7m) | **$292** |
| o. | **TOTAL COST OF EQUIPMENT DECONTAMINATION (7c + 7g + 7k + 7n):** | **$112,955** |

| | | |
|---|---|---|
| **8. TRUCK WASH STATION DECONTAMINATION** | | |
| a. | Number truck wash stations: | 4 |
| b. | Area of station for decontamination per station:<br>(Square Feet) | 3,000 |
| c. | Quantity of gravel/soils removal for decontamination per station:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) 100 cubic yards/station x 4 stations | 400 |
| d. | Unit cost for decontamination wash-down:<br>(See CDA) ($/Square Feet) | $2.11 |
| e. | Unit cost for soils/gravel removal:<br>(See CDA) ($/Cubic Yard) | $1.17 |
| f. | Total cost of decontamination:<br>(8a x 8b x 8d) + (8a x 8c x 8f) | **$25,788** |
| g. | Decontamination residual generation rate:<br>(See CDA) (Gallons/Square Feet) | 2.6 |
| h. | Total aqueous decontamination residual generated:<br>(Gallons) (8a x 8b x 8g) | 31,200 |
| i. | Unit cost of off-site transportation and management at treatment facility with NPDES permit:<br>(See CDA) ($/Gallon) | $0.76 |
| j. | Quantity of solid residuals from decontamination:<br>(See CDA) (Gallons) (8h x 0.05) | 1,560 |
| k. | Total estimated cost of off-site transportation and management at treatment facility:<br>[(8h – 8j) x 8h] | **$22,526** |
| l. | Quantity of decontamination residuals to be stabilized prior to disposal:<br>(See CDA) (8j converted from gallons to cubic yards) (8i/55 x 0.27) | 7.7 |
| m. | Unit cost of bulk stabilization of residuals:<br>(See CDA) ($/Cubic Yard) | $180 |
| n. | Total cost of stabilization of residuals:<br>(8l x 8m) | **$1,386** |
| o. | Estimated volume of treated decontamination residuals:<br>(See CDA – Landfill Capacity Assurance) (Cubic Yards) [(8l x 1.6] | 12.3 |
| p. | Unit cost of on-site landfill disposal of stabilized residuals:<br>(See CDA) ($/Cubic Yard) | $13.51 |
| q. | Total cost of on-site landfill disposal of stabilized residuals:<br>(7l x 7m) | **$166** |
| r. | Quantity of fill material needed on-site for regrading of truck wash:<br>(Cubic Yards) (8a x 8c) | 400 |
| s. | Unit cost of fill material for regrading, excavation, haul:<br>(See CDA) ($/Cubic Yard) | $3.10 |
| t. | Total cost of fill material:<br>(8r x 8s) | **$1,240** |
| u. | Unit cost of site regrading:<br>($/Cubic Yard) | $1.23 |
| v. | Total cost of regrading:<br>(8r x 8u) | **$492** |
| w. | **TOTAL COST OF TRUCK WASH DECONTAMINATION/RESTORATION (8e + 8k + 8n + 8q + 8w):** | **$51,598** |
| **9. TOTALS FOR ANCILLARY CLOSURE ACTIVITIES** | | |
| **a.** | **TOTAL COST OF ANCILLARY CLOSURE ACTIVITIES [1p + 2c + 3d + 4a + 5h + 6c + 7o + 8w]:** | **$1,135,457** |
| **b.** | **TOTAL DECONTAMINATION RESIDUE FROM ANCILLARYCLOSURE ACTIVITIES**<br>**(**1m + 5a +7l + 8c + 8o) in cubic yards | **1010.9** |

## Worksheet CLO-7, Closure Certification

| | | |
|---|---|---|
| **1. SAMPLING AND ANALYSIS TO CONFIRM DECONTAMINATION** | | |
| a. | Number of samples for HWMU decontamination confirmation:<br>(See CDA less Container Management Facility samples) | 20 |
| b. | Number of samples for confirmation of "clean" wash water:<br>(See CDA) | 10 |
| c. | Unit cost of liquid analysis:<br>(See CDA) ($/Sample) | $1,500 |
| d. | Cost of liquid sample analysis for decontamination confirmation:<br>[(1a + 1b) x 1c] | **$45,000** |
| e. | Number of samples for soil decontamination confirmation:<br>(See CDA less Container Management Facility samples) | 59 |
| f. | Unit cost of soil/sludge analysis:<br>(See CDA) ($/Sample) | $2,800 |
| g. | Cost of soil/sludge sample analysis for decontamination confirmation:<br>(See CDA) (1e + 1f) | **$165,200** |
| h. | **TOTAL ESTIMATED ANALYTICAL COSTS FOR FACILITY CLOSURE (1d + 1g):** | **$210,200** |
| **2. CERTIFICATION DOCUMENTS BY INDEPENDENT PROFESSIONAL ENGINEER (SEE CDA)** | | |
| a. | Certification documents by independent professional engineer (see CDA) | **$131,158** |
| | | |
| | **TOTAL CLOSURE CERTIFICATION COSTS (1h + 2a):** | **$341,358** |

## Table F, Total Site-Wide Facility Clousre Cost Estimates

| **Total Site-Wide Facility Closure Cost Estimate** | |
|---|---|
| Hazardous Waste Management Unit Inventory Management (CLO-1) | $193,673 |
| Hazardous Waste Management Unit Decontamination (CLO-2) | $528,267 |
| Treatment and Disposal of Decontamination Residuals (CLO-3) | $181,054 |
| Final Cover/Landfill Closure (CLO-4) | $7,025,319 |
| Groundwater Monitoring During Closure (CLO-5) | $475,318 |
| Ancillary Closure Activities (CLO-6) | $1,135,457 |
| Closure Certification (CLO-7) | $341,358 |
| Container Management Facility Closure Cost (Table E less Closure Certification of $65,579 & Contingency) | $1,052,567 |
| **Subtotal Total Site-Wide Facility Closure Cost** | **$10,933,013** |
| Administrative and Contingency Costs (10%) | **$1,093,301** |
| **Total Estimated Present Worth (2001 $'s) Of Closure Costs** | **$12,026,314** |

## B. POST-CLOSURE PLAN

### 15. INTRODUCTION

This facility post-closure document is set forth to comply with the applicable requirements of Section R315-8-7 - Closure and Post-Closure and R315-8-8 - Financial Requirements of the Utah Code. The contents apply to the Grassy Mountain facility, EPA ID UTD991301748, to reflect areas and issues contained within the most current, approved permit. All portions of the permitted facility, which are interpreted to be affected by the post-closure requirements, are listed in Section 2 of this plan.

This plan sets forth the necessary actions and requirements, which could reasonably be expected, for post-closure care of the Grassy Mountain facility. The post-closure monitoring and maintenance will, to the extent practicable, be developed to detect, in a timely manner, and prevent post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters, or to the atmosphere.

Post-closure care for all affected units will commence, in accordance with this plan, upon completion of closure requirements and issuance of any approved modifications of same.

### 16. FACILITY POST-CLOSURE REQUIREMENTS

#### 4.1. Affected Hazardous Waste Management Units

Post-Closure care is required for all hazardous waste management units (HWMUS) at which hazardous wastes will remain after closure. Based on the current permit for the facility, the landfill units are the only HWMU's subject to post-closure care.

Grassy Mountain currently has twelve (12) landfill disposal units approved under the permit: RCRA Cells 1, 2, 3, 4, 5, and 7; TSCA/RCRA Cell B/6; Industrial Cells 1 and 2; and TSCA Cells X, Y, & Z. Industrial Cells 1 & 2 have been closed as RCRA Cells and are managed as RCRA cells. RCRA Cells 1, 2 and 3 have been closed. The RCRA Groundwater Program (RCRA Permit Module VII) covers that portion of the groundwater monitoring program for the TSCA cells that the TSCA groundwater monitoring program does not cover. The TSCA program covers Class 1 volatiles and semi-volatiles and Class 3 parameters. TSCA Cells X and Y are closed. The general configuration and location of each of the landfill cells at Grassy Mountain is illustrated in Attachment II-1. Specific details of the particular RCRA units are contained in Module VI of the permit and permit references such as the associated Design Engineering Reports (DERs), Constructed Cell Record Drawings, and QA/QC Documentation.

#### 4.1. Monitoring and Maintenance Activities

After final closure of any landfill cell, the Permittee shall comply with the monitoring and maintenance requirements of the plan approval and R315-8-14.5 that include, as a minimum, the following:

- Groundwater monitoring and administrative reporting in compliance with the applicable requirements of R315-8-6-1
- Maintenance of the groundwater monitoring system to allow compliance with the groundwater monitoring requirements of R315-8-6.1 (c);
- Operation of the leachate collection/detection and removal system until such time as leachate generation accumulates at a rate too small to pump. This shall include all administrative reporting requirements of the permit;
- Maintenance of the integrity and effectiveness of the final cover, including repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events,
- Prevention of run-on and run-off from eroding or otherwise damaging the final cover of any unit or cell; and
- Protection and maintenance of surveyed benchmarks used in complying with R315-B-14.5.

The specific activities detailed below include all tasks that could reasonably be expected during the post-closure care period. Typical monitoring and maintenance inspection, maintenance and operational tasks, and the expected frequency are discussed below.

### 4.2. Groundwater Monitoring

In accordance with UHWMR R315-8-6, the Permittee shall conduct post-closure groundwater monitoring activities for the HWMU's consistent with the most current plan approval conditions for these units. These conditions are outlined and set forth in Module VII of the permit.

The current conditions delineated in Module VII and Module II have been utilized for the purpose of projecting post-closure activities and estimating post-closure costs. The facility groundwater monitoring program includes all monitoring wells defined in Module VII for the RCRA Waste Management Areas at the time of closure. Fifty-five (55) wells, 23 TSCA, 30 RCRA, 3 IWC-3 and 4 background wells are considered in this estimation of post-closure care costs. The current annual groundwater monitoring, administration, reporting and maintenance costs tabulated in Worksheet CLO-5, "Groundwater Monitoring During Closure Activities" are utilized as the basis for post-closure groundwater monitoring costs. For closure cost estimate purposes, it is assumed that the monitoring costs of two of the background wells are covered by the TSCA post-closure plans.

### 4.2. Leachate Management

In accordance with UHWMR R315-8.14.5(b), the Permittee shall continue to operate the leachate collection and leak detection systems associated with each of the RCRA HWMU's until such time as leachate generation accumulates at a rate too small to pump with the existing pumps. "A rate too small to pump with existing pumps" is defined as follows: If daily pumping produces 650 gallons or less of leachate per seven day period for two weeks, weekly pumping is allowed. If weekly pumping produces 150 gallons or less of leachate per week for two months, monthly pumping is allowed. If monthly pumping produces 250 gallons or less per month for two months, bi-monthly pumping is allowed. If bi-monthly pumping produces 167 gallons or less for each of three, two-month periods, semi-annual pumping is allowed. If pumping

produces 250 gallons or less per semi-annual pumping for two semi-annual periods, annual pumping is allowed. If pumping has been moved to a less frequent schedule and pumping produces more leachate than would have been produced at the previous frequency, then the pumping frequency will return to the previous frequency. This. logic is repeated in the table below. Any existing data may be used to determine the starting frequency during post-closure.

| Frequency | If at or less than this amount, go to next frequency. | Average Daily Pumping Rate | If greater than this amount for any one period, return to previous frequency. |
|---|---|---|---|
| Daily | 650 Gallons / 7-Days for Two Weeks | 92.9 Gallons/Day | N/A |
| Weekly | 150 Gallons/Week for Two Months | 21.4 Gallons/Day | 650 Gallons / Week |
| Monthly | 250 Gallons / Month for Two Months | 8.2 Gallons/Day | 650 Gallons / Month |
| Bi-Monthly | 167 Gallons / Two-Month Period for Three Two-Month Periods | 2.7 Gallons/Day | 500 Gallons / Two-Month Period |
| Semi-Annual | 250 Gallons/Six Months | 1.4 Gallons/Day | 501 Gallons/Six Months |
| Annual | N/A | N/A | 500 Gallons/Year |

The management of these systems shall comply with the operational and reporting requirements of R315-8.1-4.2(a)(2) and applicable requirements contained in Module VI of the permit. The current permit conditions and operational procedures for leachate management have been utilized for the purpose of projecting post-closure activities and estimating post-closure costs as described under "Ancillary Closure Activities' in the Cost Documentation Appendix. Leachate Management Costs over a two-year period are discussed in the CDA and estimated in Worksheet CLO-6, “Ancillary Closure Activities," Section 1, "Leachate Management". No solid residuals are expected to be generated from collecting leachate from closed cells over the post-closure period. The total post-closure annual costs for leachate collection and disposal efforts exclude solids disposal. This method of estimating leachate costs is believed to be conservative based on a reasonable expectation that reduced rates of leachate generation will result at the closed cells over time.

## 4.2. Maintenance Activities

In accordance with UHWMR R315-8.14.5 and applicable plan approval conditions, the Permittee shall maintain the integrity and effectiveness of the final cover, including making repairs as necessary to correct the effects of settling, subsidence, erosion or other events that could reasonably be expected to occur over the 30 year post-closure period. These maintenance activities include maintenance of the leachate management system and groundwater monitoring system as necessary. Groundwater monitoring system maintenance costs are included in the sampling and analysis cost estimates.

## 4.4. Routine Inspections

Routine inspections of pertinent facility systems are required by this plan and applicable regulations. Typical inspection items are listed below as a guide for the monitoring and

inspection of the Grassy Mountain facility at such time when no hazardous waste operations are taking place. During facility operations, the units in "post-closure status" will be inspected and monitored in accordance with the operations inspection schedule presented in Module II.

Typical inspection items will include monthly site perimeter & general facility checks for items listed in this Post Closure Plan, such as; well integrity, locks, leachate risers integrity, leachate pump function (during leachate management), site and perimeter security and signage, etc.

Typical landfill cell checks will be performed monthly and after severe weather events to include observation for erosion, standing liquids, subsidence, burrows, and any deterioration of final cover, runoff management systems.

**4.4.** Maintenance of Waste Containment Systems

Maintenance of the final cover of any disposal cell shall be performed to comply with the permit conditions stated within. It is expected that an annual maintenance operation will be required to meet the needs of the facility. This annual operation will include replacement of soils lost to erosion which might threaten the integrity of the cover, maintenance of the drainage channels and culverts which direct any run-off away from the unit, controlling burrowing rodents as necessary to counter infestations, and control measures to prevent growth of woody or deep-rooted plants which might damage the integrity of the final cover.

**4.4.** Maintenance of the Leachate Management System

Maintenance of the leachate management system will include maintenance of the leachate evacuation pumping systems, temporary leachate storage units and other pertinent portions of the leachate collection/detection systems during such time as leachate is generated in quantities, which are able to be pumped. The leachate is expected to be managed at an appropriately permitted offsite treatment and disposal facility. The leachate collection/detection systems may be expected to occasionally require replacement of pumps and miscellaneous routine maintenance of equipment. These costs are estimated in the CDA.

**4.4.** Maintenance of the Groundwater Monitoring System

The groundwater monitoring system will require routine and non-routine maintenance throughout post-closure. It is expected that pump repair and replacement and other minor maintenance will be required and these costs have been included in the semi-annual groundwater monitoring cost.

**4.4.** Maintenance of the Security System

The maintenance of the security system for this facility is expected to be minimal due to its remote location. Any security fencing and gates provided will be maintained and warning signs surrounding the facility will be maintained and replaced as necessary to prevent the inadvertent entry of unauthorized personnel.

## 4.2. Post-Closure Care During Facility Operation

It should be noted that there will be numerous units in post-closure status and care while the facility is still operating under the current and future permits. All maintenance and inspections

of units in post-closure will be performed during the normal operation of the facility while it is still operational. This cost estimate is, therefore, believed to be conservative.

### 4.2. Post-Closure Contact

The anticipated post-closure contact for the Grassy Mountain facility is stated below. At the time of final closure of the facility any necessary modifications to this designated contact will be made.

Vice President of Operations
Clean Harbors Environmental Services
1501 Washington Street
P.O. Box 859048
Braintree, Massachusetts 02185-9048
(781) 849-1800

### 4.2. Post-Closure Care Notices

The Permittee shall, no later than 60 days after certification of closure of each hazardous waste disposal unit, submit records as delineated by R315-8-7 and 40 CFR 264.119(a) to the local zoning authority and the Utah Solid and Hazardous Waste Board care of the Executive Secretary. In addition, the Permittee shall, within 60 days of certification of closure of the first hazardous waste disposal unit and within 60 days of certification of closure of the last hazardous waste disposal unit, record, in accordance with State law, a notice on the deed which meets the requirements of 40 CFR 264.119(b). A certification that such notice has been executed, as required by 40 CFR 264.119(b)(2) shall be submitted to the Utah Solid and Hazardous Waste Board care of the Executive Secretary.

### 4.2. Post-Closure Certification

The Permittee shall, no later than 60 days after the completion of the 30 year post-closure period for any hazardous waste disposal unit, submit a certification to the Solid and Hazardous Waste Control Board care of the Executive Secretary, in accordance with 40 CFR 264.120 and R315-8-7, stating that all post-closure requirements have been completed in accordance with this plan and any required modifications of same.

## 17. FINANCIAL REQUIREMENTS FOR POST-CLOSURE

The post-closure cost estimates reflect the requirements of R315-8-8 and 40 CFR 264, Subpart H - Financial Requirements. More specifically, this section reflects the necessary modifications to respond to 40 CFR 264.144.

### 4.1. Post-Closure Care Cost Estimates

The above text provides the information utilized to develop the cost estimates provided in the table below. Additional information is found in Appendix 1, "Cost Documentation Appendix (CDA)".

## Table G: Post-Closure Care Cost Estimate Summary

| Post-Closure Care Cost Estimate Summary | Annual |
|---|---|
| Groundwater Monitoring (CLO-5) | $148,905 |
| Leachate Management (CDA) Average Over 30-Years | $44,497 |
| Leachate Collection System Maintenance and Pump Replacements (CDA) | $10,780 |
| Cap Maintenance (CDA) | $9,200 |
| Routine Inspections (CDA) | $7,800 |
| Annual Independent Professional Post-Closure Review/Certification (CDA) | $29,268 |
| **Subtotal Estimated Facility Post-Closure Costs =** | **$250,450** |
| Administrative & Contingency Costs (CDA) | $25,045 |
| For Potential RFI's / Corrective Action (CDA) | $25,045 |
| Total Estimated Present (2001 $'s) Annual Post-Closure Care Costs | $300,540 |
| Total Present Worth of Annualized Post-Closure Costs (Annual Costs x Length of PC) | $9,016,205 |
| Total Cost of Final Certification of Post-Closure Activities (CDA) | $42,000 |
| **Total Estimated Present Worth of Facility Post-Closure Care Costs =** | **$9,058,205** |

## C. FINANCIAL ASSURANCE MECHANISM

## 18. FINANCIAL ASSURAIRICES

### 4.1. Financial Assurance for Closure (40 CFR 264.143 & 264.146)

In accordance with the regulations cited above, Clean Harbors Grassy Mountain, LLC., as the owner/operator of the Grassy Mountain facility, is required to provide assurances that there will be funds available to close the facility at some time in the future. The purpose of these assurances is to guarantee that closure can be performed by a third party, if for some reason Clean Harbors Grassy Mountain, LLC. is unable to do so itself. As specified in Appendix 1 of this application, the minimum dollar amount to be guaranteed, in 2001 dollars, is $12,438,327. This figure will be updated at least annually in response to inflation, and as often as needed to reflect changes at Grassy Mountain.

There are six different methods allowed by the rules to guarantee the Closure Costs:

- Closure Trust Fund
- Surety Bond Guaranteeing Payment into a Closure Trust Fund
- Surety Bond Guaranteeing Performance of Closure
- Closure Letter of Credit
- Closure Insurance
- Financial Test and/or Corporate Guarantee.

Clean Harbors Grassy Mountain, LLC. shall use one of these as the financial assurance mechanism for the Grassy Mountain facility. The financial assurance documentation or certification of such documentation is maintained at the office of the Division of Solid and Hazardous Waste. Clean Harbors Grassy Mountain, LLC. shall remain in compliance with the applicable provisions of 40 CFR §264.143 as they relate to the mechanism used for the financial assurance mechanism for closure.

### 4.1. Financial Assurances for Post-Closure (40 CFR 264.144 & 264.146)

In accordance with the regulations cited above, Clean Harbors Grassy Mountain), LLC., as the owner/operator of the Grassy Mountain facility, is required to provide assurances that there will be funds available to maintain the facility through the post- closure period. The purpose of these assurances is to guarantee that post-closure care can be performed by a third party, if for some reason Clean Harbors Grassy Mountain, LLC. is unable to do so itself. As specified in Appendix 1 of this application, the minimum dollar amount to be guaranteed, in 2001 dollars, is $9,058,205. This figure will be updated at least annually in response to inflation, and as often as needed to reflect changes at Grassy Mountain.

There are six different methods allowed by the rules to guarantee Post-Closure Care:

- Post-closure Trust Fund
- Surety Bond Guaranteeing Payment into a Post-Closure Trust Fund
- Surety Bond Guaranteeing Performance of Post-Closure Care
- Post-Closure Letter of Credit

- Post-Closure Insurance
- Financial Test and Corporate Guarantee for Post-closure Care.

Clean Harbors Grassy Mountain, LLC. shall use one of these as the financial assurance mechanism for Grassy Mountain. The financial assurance documentation or certification of such documentation is maintained at the office of the Division of Solid and Hazardous Waste. Clean Harbors Grassy Mountain, LLC. shall remain in compliance with the applicable provisions of 4.0 CFR §264.144 as they relate to the mechanism used for the financial assurance mechanism for post-closure.

### 4.1. Liability Requirements (40 CFR 264.147)

Clean Harbors Grassy Mountain, LLC. maintains liability insurance for sudden accidental occurrences, as required by the rules cited and Module II.Q.1. of the Clean Harbors Grassy Mountain, LLC., RCRA Permit. The certificate of insurance for the required liability insurance as specified by 40 CFR 264.147 is maintained on file at the office of the Division of Solid and Hazardous Waste.

### 4.2. Variance Procedures and Adjustments by the Regional Administrator

Clean Harbors Grassy Mountain, LLC. has no plans to use variance procedures or adjustments, therefore, this section is not applicable. There are no known adjustments that have been made by either the Regional Administrator or the Executive Secretary of the Utah Solid and Hazardous Waste Control Board.

### 4.2. Use of State Required Mechanisms

The facility is not covered by any State financial mechanism, therefore, this section is not applicable.

### 4.2. State Assumption of Responsibility

This section is not applicable to Clean Harbors Grassy Mountain, LLC.

**APPENDIX 1**
**COST DOCUMENTATION**

| INVENTORY MANAGEMENT | | |
|---|---|---|
| **General Management Practices** | | |
| **Re-Containerization of Waste Stream** (Source: Americon 2001) | | |
| Estimate Support: It has been assumed that the most common method for waste stream handling would be by containerization in 55 gallon units for transport to off-site disposal. It serves as the more conservative approach even if it is decided at final closure to transport by bulk to the treatment disposal site. Experience indicates that approximately 2% of the containers received at a facility will require re-containerization for a variety of reasons. It is estimated that an additional 1% of all containers transported to other treatment and disposal facilities will require re-containerization due to unexpected damage and shipment effects. Estimate a total 3% will be re-containerized. | $/Drum | 200 |
| Fraction of Total Number of Drums | Fraction | 0.03 |
| **Container Mobilization** (Source: Americon 2001) | | |
| Forklift Rental & Operating Cost | $/Workday | $106 |
| Labor (Equipment Operator) | $/Hour | $30 |
| Labor (1 Laborer) | $/Hour | $25 |
| Operated Unit Cost | $/Day | $556 |
| Operated Unit Cost | $/Pallet | $13.90 |
| Estimate Support: Container mobilization consists of pallet loading onto appropriate van type vehicles. Each van typically holds approximately 20 pallets or 80 – 55 gallon drums. It has been assumed that a typical 8 hour workday is consumed to process two complete loads of containerized wastes. Some waste will already be palletized and loaded; therefore it is assumed that only a fraction of any waste stream must be mobilized (palletized) for transport. | Fraction | 0.25 |
| **Off-Site Management of Containerized Hazardous Waste Inventory** | | |
| The only inventory of wastes subject to off-site management is Container Management Facility (Drum Dock 1) waste streams destined for incineration and possible off-site management of leachate liquids. Additionally, it is assumed that a fraction of the remaining Container Management Facility waste inventory destined fro incineration has been assumed. | Fraction | 0.10 |
| Transportation Costs: Unit cost of shipments to Aragonite, Utah. Source: MP Environmental 2001. | $/80 Drums | $300 |
| Incineration Costs. Source: Aragonite, Utah, incineration facility typical fee 2001. | $/Drum | $250 |
| **Off-Site Management of Inventory** | | |
| Waste Categories/Estimated Quantities:<br>Based on current record evaluations at the facility, the hazardous waste streams typical to the hazardous waste management units have been categorized by treatment requirements. Quantities will vary and these estimates represent a conservative estimate. | | |
| **Stabilization Treatment** | | |
| Of the remaining Container Management Facility inventory ("other" inventory), it is assumed that a fraction of these containers will be treated at the stabilization facility prior to ultimate landfill disposal. The waste inventory at the other units typically is liquid suitable for off-site disposition; otherwise solids in the waste inventory will be assumed to be designated for on-site management and require treatment at a stabilization unit prior to landfill disposal. | Fraction | 0.40 |
| Stabilization treatment charges including any required neutralization. Source: Current typical Grassy Mountain fees for stabilization, 2001 (Includes analytical costs if required.) | | |
| Containers (55 gallon equivalents) | $/Drum | $150 |
| Bulk | $/Yd$^3$ | $180 |
| **Direct Landfill Disposal** | | |
| The remaining fraction of the inventory of the Container Management Facility will not require any specific treatment and can be transported directly to the landfill for disposal. Note that all inventory will require charges relative to landfill disposal since these charges are not contained within the other treatment unit costs. | Fraction to not be stabilized. | 0.60 |

| | | |
|---|---|---|
| In order to more accurately assess the cost of landfill disposal, the waste streams treated by stabilization, it is assumed that the volume of waste will increase after stabilization. A "stabilization volume factor" applied to the original volume is used to account for the volume increase. This number is based on GM stabilization process experience. It is also utilized in landfill capacity assurance calculations through the Closure and Post-Closure Plan to compute capacity, which must be available at Closure. | Stabilization Volume Factor | 1.6 |

| LANDFILL CAPACITY ASSURANCE | | |
|---|---|---|
| The current permit for the Grassy Mountain facility requires that the Permittee maintain sufficient landfill capacity to accommodate the appropriate disposal of all hazardous waste inventory as well as all decontamination residuals generated during closure of the facility. Table B contains the tabulation of the required landfill capacity needed to be remaining at closure. The information was obtained from the Worksheets and this CDA. | | |
| **Landfill Capacity Assurance (LCA) – Container Management Facility (CMF)** | | |
| Conversion factors used to convert from one volume type to another are: | | |
| Gallons to Cubic Yards | $Yd^3$/55-Gallon | 0.27 |
| Cubic Feet to Gallons | Gal/Ft3 | 7.48 |
| Cubic Yards to Cubic Feet | Ft3/ $Yd^3$ | 27.00 |
| Containerized inventory for direct landfill | See CMB. | |
| Containerized inventory stabilized then landfill disposed. | See CMB. | |
| LCA Waste Inventory Total Volume | See CMB & Table B | |
| **Landfill Disposal Costs (Source: Grassy Mountain, 2001)** | | |
| Costs associated with disposal of inventory and/or decontamination residues after stylization will be the on-site transport and placement within the cell and the cost of the airspace utilized (Grassy Mountain amortized cost of the cell volume). | | |
| Operating labor, equipment, fuels | \$/ton or $Yd^3$ | \$2.00 |
| Amortized cost of airspace (Cell 7) | \$/$Yd^3$ | \$11.51 |
| Unit Landfill Disposal Cost (Bulk) | \$/$Yd^3$ | \$13.51 |
| Unstabilized load of drums | Drums/$Yd^3$ | 3.67 |
| Stabilized load of drums | Drums/$Yd^3$ | 2.30 |
| Unit Landfill Disposal Cost (Per Unstabilized Drums) | \$/Unstab. Drum | \$3.68 |
| Unit Landfill Disposal Cost (Per Number of Drums to be Stabilized) | \$/3 Stab. Drum | \$5.89 |
| **<u>Put-Pile Disposal Costs</u>** (Source: Grassy Mountain, 2001) | | |
| Put-piles will vary in size. Some smaller and some larger. Also, a majority of these will be successfully treated with initial stabilization. The cost of disposing of these put-piles is included in the landfill and stabilization costs. The remainder of the put-piles will have to be treated again and disposed. The following assumptions are used to develop the costs for those that have to be treated. | | |
| Maximum number of put-piles | Number | 250 |
| Average put-pile size (Source: Grassy Mountain, 2001) | $Yd^3$ | 45.00 |
| Fraction of put-piles that must be retreated (Source: Grassy Mountain, 2001) | Fraction | 0.20 |
| Average analysis cost (Source: MSAI, 2002) | \$/Pile | \$250 |
| Volume increase as a result of stabilization | Factor | 1.30 |
| Operating labor, equipment, fuels | \$/ton or $Yd^3$ | \$2.00 |
| Stabilization costs (includes analytical, transportation, analytical review, profit margin) | \$/ $Yd^3$ | \$180 |
| Total Re-Stabilization Costs | \$/ $Yd^3$ | \$182 |

| HAZARDOUS WASTE MANAGEMENT UNIT (HWMU) DECONTAMINATION AND DISPOSAL OF DECONTAMINATION RESIDUES | | |
|---|---|---|
| For purposes of the Closure Cost Estimate decontamination of the hazardous waste management units and related structures I assumed to be conducted by high-pressure washing. The initial wash-down would be performed with water and appropriate surfactant additives. This will be supplemented with scrubbing with brushes and solution as needed. This effort will be followed by a second complete washing/rinse with water only. Unless analytical sampling of the final rinse waters/residue indicated otherwise, no further decontamination will be performed. All water utilized for decontamination will be delivered to the site by tanker truck to ensure that non-contaminated water is employed in the process. It is assumed that the current potable water system will be the distribution system of this clean water. Cost estimates assume that all wash water will be treated at an off-site facility possessing appropriate permits. The solid residues generated by decontamination are assumed to be a fraction of the liquid decontamination total and are included in the closure plan worksheet section. The text hereinafter presents the "area" to be decontaminated and other pertinent information specific to each hazardous waste management unit and its ancillary equipment. Also included is the estimated quantity of soils removal for decontamination at each unit to be landfilled direct. It is assumed, for estimating purposes, that the soils removal will include the top 6 inches of soil within 6 feet of the outside containment perimeter. | | |
| **Protective Clothing and Safety Equipment** | | |
| The estimated number of personnel to be outfitted with full protective and safety equipment during closure operations is shown to the right of this text. This includes such operations as the landfill, stabilization, decontamination, drivers, lab operations, leachate treatment and some miscellaneous personnel. | # of persons | 34 |
| **Protective Clothing, Basic Level B (Source: Americon 2001)** | | |
| Splash Suit | $/Item | $10 |
| Chemical Resistant Boots | $/Item | $50 |
| Nitrile Gloves (Disposable) | $/Item | $1.50 |
| Goggles | $/Item | $10 |
| Full-Face Respirator and Cartridges | $/Item | $200 |
| Hard Hat | $/Item | $6 |
| 30% Surcharge for Disposable Equipment During Closure | $$Item | $83.25 |
| **Total Initial Cost:** | $/Person | $360.75 |
| Protective Clothing, Disposable Items (Source: Americon 2001) | Item/Day /Person | 1 |
| Splash Suit | $/Item | 10 |
| Nitrile Gloves (Disposable) | $/Item | 2 |
| Cartridges | $/Item | 5 |
| Total Renewing Cost | $/Item | 18 |
| Closure Time | Years | 2 |
| | Hours/Year | 2,080 |
| | Hours/Day | 10 |
| | Days | 416 |
| **Total Renewing Cost for Two Year Closure Period:** | $/Person | $7,280 |
| **Overview of Decontamination Methods Assumed for Cost Estimating Purposes (Source: Americon 2001)** | | |
| High-pressure water wash systems operate at a water production rate of between 2.5 and 6.5 gallons per minute. For estimating purposes, 5 gallons per minute is used, since this seems to be the greater rate within the new generation of wash systems. Note: The following are crew production rates and estimates of resultant residual production estimated in 1991. upon review of these rates of production and associated costs locally, it is believed the listed costs continue to be very conservative estimates of credible current costs to perform this work; therefore no change has been made (Source: Americon, 2001). | | |
| Initial Wash | | |
| Cleaning production is estimated at 1,200 square feet per shift. | Sq. Ft./Shift | 1,200 |
| Hours of activity per shift | Hours/Shift | 6.5 |
| Production | Sq. Ft./Min. | 3 |
| Spray unit residual generation | GPM | 5 |
| Residual generation rate | Gal./Sq. Ft. | 1.6 |
| Residual generation rate | Gal./Day | 1,950 |

| | | |
|---|---|---|
| **Final Wash/Rinse** | | |
| Cleaning production Rate | Sq. Ft./Shift | 2,000 |
| Hours of Activity Per Shift | Hours/Shift | 6.5 |
| Cleaning Production Rate | Sq. Ft./Min. | 5 |
| Spray Unit Residual Generation | GPM | 5 |
| Residual Generation Rate | Gal./Sq. Ft. | 1.0 |
| Residual Generation Rate | Gal./Day | 1,950 |
| **Crew/Equipment Overview** | | |
| One Laborer Foreman | | |
| Four Laborers | | |
| One Compressor | | |
| Tools, Accessories and Hoses | | |
| Portable Pump (Centrifugal) | | |
| Surfactant/Chemicals | | |
| **Total Cost Per Shift (Source: Americon 2001):** | $/Shift | $1,368 |
| **High-Pressure Washing** | | |
| The estimated production of the crew and equipment above for the initial wash. | Sq. Ft./Shift | 1,200 |
| Surcharge due to travel distances to the facility and other possible ramifications to cover travel time, mileage, etc. | Fraction | 0.30 |
| Estimated cost for the labor portion of the initial decontamination. | $/Sq. Ft. | $1.48 |
| **High-Pressure Rinsing** | | |
| The final rinse for the facility will be less costly due to higher production and elimination of any surfactant and/or chemicals. | | |
| The estimated production of the crew and equipment above for the initial wash. | Sq. Ft./Shift | 2,000 |
| Surcharge due to travel distances to the facility and other possible ramifications to cover travel time, mileage, etc. | Fraction | 0.30 |
| Estimated cost for the labor portion of the initial decontamination. | $/Sq. Ft. | $0.89 |
| Wash Water Supply<br>It has been estimated, based on the production rates, that it will be necessary to provide approximately 1,950 gallons of potable water for decontamination each shift. One delivery of water is 10,000 gallons assuming it is stored in the facility's current potable water storage and distribution system. | | |
| Crew (One tanker truck and driver) | $/Day | $720 |
| Crew delivery | Gal. | 10,000 |
| Crew (One tanker truck and driver) | $/Gal. | $0.072 |
| Water Cost (Including transportation) | $/Gal. | $0.077 |
| Water Cost | $/Day | $150.15 |
| Wash Water | $/Sq. Ft. | $0.1251 |
| Rinse Water | $/Sq. Ft. | $0.0751 |
| **Temporary Decontamination Residue Storage** | | |
| Wash and rinse waters both require a vacuum tanker to remove and transport residual wash/rinse waters from the area of decontamination to the leachate storage tanks. | | |
| One tanker truck with driver (5,000 gallons) (Source: MP Environmental 2001) | $/Day | $600 |
| **Total Cost of Water, Wash/Rinse and Temporary Storage** | | |
| Unit Cost – Initial High-Pressure Decontamination | $/Sq. Ft. | $2.11 |
| Unit Cost – Final High-Pressure Decontamination | $/Sq. Ft. | $1.26 |
| **Aqueous Treatment of Residuals** | | |
| It is assumed that aqueous residuals would be shipped off-site to the Los Angeles facility for treatment and disposal. | $/Gal. | $0.76 |
| Treatment facility costs (LA Facility, 2001) | $/Gal. | $0.30 |

| | | |
|---|---|---|
| Transportation to LA Facility (Source: MP Environmental, 2001) | $/Load | $2,317.30 |
| | Gal./Load | 5,000 |
| | $/Gal. | $0.46 |
| **Container Management Facility Decontamination** | | |
| The structure for the Container Management Facility is comprised of the pad, foundations and enclosure structures for Drum Dock 1, Pad 2A, Pad 2B, Pad 3A and Pad 3B. The estimated internal surface area of this facility is 46,511 square feet. | Sq. Ft. | 46,511 |
| Time required for initial rinse. | Days | 39 |
| Tanker cost for initial rinse. | $ | $13,953 |
| Initial rinse cost per Square Foot. | $/Sq. Ft. | $0.50 |
| Time required for final rinse. | Days | 23 |
| Tanker cost for final rinse. | $ | $13,953 |
| Final rinse cost per Square Foot. | $/Sq. Ft. | $0.50 |
| **Decontamination Residues** | | |
| Decontamination residues to be managed as a result of the closure of the Container Management Facility are: the aqueous residues and resulting solids residue from the decontamination effort, accumulating at the rates shown below. | | |
| Wash water generation. | Gal. | 75,580 |
| Solids generation rate (Fraction of Wash Water) | Fraction | 0.05 |
| Solids generation rate [1 gallon = (1/(7.48 x 0.27)) = 0.005 Cubic Yards] | Gal. | 3,779 |
| Solids generation rate. | $Yd^3$ | 19 |
| Rinse water generation. | Gal. | 45,348 |
| LCA | $Yd^3$ | 30 |
| Solid residuals (sludges from wash down liquids) volumes are calculated similarly for Waste Management Units other than the Container Management Facility. These calculations are shown on the Worksheets (CLO). | | |
| Removal of any potentially contaminated soils immediately surrounding the Container Management Facility structure has been considered. The quantity of soils (LCA) is estimated to be: | $Yd^3$ | 80 |
| **Wastewater Treatment Tank System Decontamination (4 Areas)** | | |
| **Caustic Liquid Containment Area**<br>The caustic liquid containment area is a reinforced concrete containment and contains two tanks. The tank surface area, interior, exterior, is approximated for each surface. Tank interior surface area is increased by a factor as a surcharge to account for confined space entry working conditions. | | |
| Tank Interior Surcharge | Factor | 1.5 |
| Containment | Sq. Ft. | 1,500 |
| Tank Exterior (Both Tanks) | Sq. Ft. | 1,960 |
| Tank Interior (Both Tanks) | Sq. Ft. | 2,940 |
| **Total =** | Sq. Ft. | 6,400 |
| Soils Removal (2 Areas) (LCA) | $Yd^3$ | 20 |
| **Acid Liquid Containment Area** | | |
| The acid liquid containment area is a reinforced concrete containment and contains the two acid storage tanks. The tank surface areas, interior and exterior, are approximated. Tank interior surface area is increased by a factor as a surcharge to account for confined space entry conditions. | | |
| Containment | Sq. Ft. | 1,508 |
| Tank Exterior (Both Tanks) | Sq. Ft. | 1,482 |
| Tank Interior (Both Tanks) | Sq. Ft. | 2,223 |
| **Total =** | Sq. Ft. | 5,213 |
| Soils Removal (2 Areas) (LCA) – See Caustic Containment Area | N/A | N/A |
| **Treated Liquid Containment Area** | | |
| The treated liquid containment area is a reinforced concrete containment and contains the one storage tank. The tank surface areas, interior and exterior, are approximated. Tank interior surface area is increased by a factor as a surcharge to account for confined space entry conditions. Ancillary piping and pumps have already been removed and disposed and are thus not accounted for in this cost estimate. | | |
| Containment | Sq. Ft. | 1,434 |

| | | |
|---|---|---|
| Tank Exterior (One Tanks) | Sq. Ft. | 772 |
| Tank Interior (One Tanks) | Sq. Ft. | 1,158 |
| **Total =** | Sq. Ft. | 3,364 |
| Soils Removal (LCA) | $Yd^3$ | 15 |
| **Stabilization Tank System Decontamination** | | |
| This unit is broken down into tank units and containment/process area for convenience. The approximate surface area of the containment/process area to be decontaminated including the retaining walls and sumps is shown below. The approximate total surface area, interior and exterior, of the double-walled, free-standing, open topped tank units is shown below. For the purposes of this estimate all three of the tanks have been assumed to leak into the leak detection system, requiring dismantling and total decontamination. The increased tank surface area to be decontaminated is shown. The decontamination of these tanks will also generate gravel for landfill disposal and must be accounted for in the LCA. | | |
| Containment | Sq. Ft. | 7,825 |
| Tank Exterior (Three Tanks) | Sq. Ft. | 3,240 |
| Tank Interior (Three Tanks) | Sq. Ft. | 3,240 |
| **Total =** | Sq. Ft. | 14,305 |
| Soils Removal (LCA) | $Yd^3$ | 70 |
| **Stabilization Tank Demolition/Dismantling (Source: Americon 2001)** | | |
| Steel tank demolition is assumed to require oxy/acetylene torch cutting with crane-aided mobilization of the dismantled components or parts. The unit costs presented here are applied to the Waste Stabilization Tanks assumed to require demolition for this estimate. Estimate Support: For the purpose of demolition of a Stabilization Tank, it has been assumed that approximately 246 linear feet of torch cutting will be required to dismantle a tank into manageable proportions. One 10 hour day is estimated to be needed to perform demolition and loadking. | | |
| Cost of Torch Cutting (1" Plate, 246 Feet of Cutting) | $/Foot | 4 |
| Number of Feet to Cut | Feet | 246 |
| Cost of Operated Hydraulic Crane (Source: Americon 2001) | $/Day | $920 |
| Crane Operating Days | Days | 1 |
| Unit Cost of Stabilization Tank Demolition | $ | $1,904 |
| Nu mber of Tanks to Demolish/Dismantle | Count | 3 |
| **Waste Solvent Tank System Decontamination** | | |
| The waste solvent containment area is a reinforced concrete containment and contains the two solvent storage tanks. The tank surface areas, interior and exterior, are approximated. Tank interior surface area is increased by a factor as a surcharge to account for confined space entry conditions. | | |
| Containment | Sq. Ft. | 1,557 |
| Tank Exterior (Two Tanks) | Sq. Ft. | 1,635 |
| Tank Interior (Two Tanks) | Sq. Ft. | 2,453 |
| **Total =** | Sq. Ft. | 5,645 |
| Soils Removal (LCA) | $Yd^3$ | 15 |
| **Leachate Treatment Tank System** | | |
| The leachate treatment tank system will remain intact at closure because it will be needed to assist in managing leachate during post-closure. However, the cost to decontaminate these is included in the closure cost estimate to reflect the ultimate closure of this unit. The leachate treatment tank system containment area is a reinforced concrete containment and contains the four storage tanks. The tank surface areas, interior and exterior, are approximated. Tank interior surface area is increased by a factor as a surcharge to account for confined space entry conditions. | | |
| Containment | Sq. Ft. | 2,000 |
| Tank Exterior (Two Tanks) | Sq. Ft. | 2,014 |
| Tank Interior (Two Tanks) | Sq. Ft. | 3,021 |
| **Total =** | Sq. Ft. | 7,035 |
| Soils Removal (LCA) | $Yd^3$ | 30 |

| | | |
|---|---|---|
| **Surface Impoundment unit Decontamination/Dismantling** | | |
| Cost estimate assumptions are that the Surface Impoundment Unit A will receive a completed high-pressure wash only on the primary liner, and if necessary, on the back of this liner and necessary areas of the secondary liner if leakage has occurred. The primary linear area to be decontaminated is approximated. | Sq. Ft. | 42,480 |
| It has been assumed, for estimating purposes, that no major leakage has occurred and only a fraction of the underside and the secondary liner components require an initial wash/rinse. | Fraction | 0.20 |
| Underside and secondary liner components requiring an initial wash/rinse. | Sq. Ft. | 8,496 |
| Since the liner and leak detection components will be disposed of in an on-site landfill, these liner components will only receive an initial wash/rinse on visible contamination. It is estimated that approximately 760 cubic yards of liner components will require landfill disposal. After these synthetic components have been rinsed of any visible contamination and properly disposed of, the removal and landfill disposal of any contaminated soils will be performed. For estimating purposes, the quantity established by the initial 1 foot of clay sub-liner and leak detection piping and media has been utilized to establish a cost item. | $Yd^3$ | 760 |
| Summary of the estimate quantities of material and areas of decontamination: | | |
| Liner Area | Sq. Ft. | 42,480 |
| Underliner Area | Sq. Ft. | 8,496 |
| **Subtotal:** | Sq. Ft. | 50,976 |
| Gravel Collection Media (Primary) | $Yd^3$ | 10 |
| Synthetic Liner Component Volume | $Yd^3$ | 760 |
| Clay Liner Component Volume | $Yd^3$ | 1,556 |
| Gravel Collection Media (Secondary) | $Yd^3$ | 51 |
| **Subtotal (Landfill Capacity Assurance):** | $Yd^3$ | 2,337 |
| **Synthetic Liner Components Removal (Source: Americon 2001)** | | |
| The removal of the synthetic liner components is a separate task, not included in the decontamination. The following crew costs cover this demolition by utilizing loaders to pull the pieces out that have been cut and rolled up to be landfilled. The costs of trucking and landfill disposal are detailed in other portions of this cost appendix.<br>Estimate Support: The unit cost per cubic yard is based on an estimate of three (3) days to remove the synthetic components during decontamination. This in turn was applied to the estimated volume of synthetic material to be removed. | | |
| Time to Complete Work | Days | 3 |
| Length of Work Day | Hours/Day | 10 |
| Laborers | Number | 4 |
| Laborers (Unit Cost) | $/Hour | $25 |
| Laborers (Unit Cost) | $/Day | $250 |
| Operators | Number | 1 |
| Operators (Unit Cost) | $/Hour | $40 |
| Operators (Unit Cost) | $/Day | $400 |
| Pumps, Hoses, Slings and Supplies | $/Day | $100 |
| One Track Loader (Unit Cost) | $/Hour | $65 |
| One Track Loader (Unit Cost) | $/Day | $650 |
| **Total (Unit Cost):** | $/Day | $2,150 |
| **Total (Unit Cost):** | $/ $Yd^3$ | $8.49 |
| **Excavation of Potentially Contaminated Soils (Source: Americon 2001)** | | |
| Excavate material and load to haul vehicle. Haul vehicle cost is included in disposal cost. | | |
| Front-End Loader or Backhoe (Fueled and Operated) | $/Hour | $70 |
| Front-End Loader or Backhoe (Fueled and Operated) | $Yd^3$/Hour | 60 |
| Front-End Loader or Backhoe (Fueled and Operated) | $/ $Yd^3$ | $1.17 |
| **Site Regarding/Restoration (Source: Americon 2001)** | | |

| | | |
|---|---|---|
| Site regarding includes replacement of soils from on-site locations during decontamination efforts at all units. The quantities utilized coincide with the volume of soils designated for landfill disposal in the decontamination section. | | |
| Unit Cost of Borrow Soil Excavation and Haul | $/ $Yd^3$ | $3.10 |
| Unit cost of Site Regrading | $/ $Yd^3$ | $1.23 |
| **Total (Unit Cost):** | $/ $Yd^3$ | $4.33 |

| **FINAL COVER AND LANDFILL CLOSURE** | | |
|---|---|---|
| Landfill closure requires a closure application for plan approval prior to closure certification. This application must include pertinent modifications to the existing closure document and any other supporting technical information to meet the regulatory requirements. The cost estimate provided in this document is based on actual square foot Closure Costs of three typical Geosynthetic Clay Liner (GCL) Closure design installations conducted in 1997. This cost information includes all consultants, staff and other pertinent costs that could be related to the typical closure of a hazardous waste landfill cell. This includes: Design, Engineering, Permitting, Miscellaneous, Administrative, Compaction of Mounded Waste, Waste Grading, GCL Compatible Bedding Material Procurement, Transportation, Placement and Grading, Geosynthetic Components (GCL, high Density Polyethylene Geomembrane, Drainage Net, Geotextile Filter Fabric), Compacted clay Cover (where required around the cell cap perimeter, compacted clay includes borrow, processing, stockpiling, haul, placement, grading and maintenance), GCL Compatible Soil Protective Cover Procurement, Transportation, Placement and Grading, Rock Armor Plate, Drainage Run-Off Control, Field Engineering, QA/QC, Testing, surveying, and Engineers Certification (See CDA-Landfill Closure and Cell Closure Quantity Estimate Tables for Details). | | |
| **Cell 4** | | |
| Approximate North/South Dimension | Feet | 490 |
| Approximate East/West Dimension | Feet | 1,709 |
| Approximate Cap Surface Area | Sq. Ft. | 528,608 |
| Closure Cap Cost (2001 $'s) (See CDA-Landfill Closure and Cell Closure Quantity Estimates) | $ | $2,213,739 |
| **Cell 5** | | |
| Approximate North/South Dimension | Feet | 710 |
| Approximate East/West Dimension | Feet | 750 |
| Approximate Cap Surface Area | Sq. Ft. | 532,576 |
| Closure Cap Cost (2001 $'s) (See CDA-Landfill Closure and Cell Closure Quantity Estimates) | $ | $2,180,905 |
| **Cell 7** | | |
| Approximate North/South Dimension | Feet | 830 |
| Approximate East/West Dimension | Feet | 830 |
| Approximate Cap Surface Area | Sq. Ft. | 688,900 |
| Closure Cap Cost (2001 $'s) (See CDA-Landfill Closure and Cell Closure Quantity Estimates) | $ | $2,630,675 |
| **TOTAL ESTIMATE:** | | **$7,025,319** |

| GROUNDWATER MONITRONG DURING CLOSURE/POST-CLOSURE | | |
|---|---|---|
| As defined in Module VII, groundwater monitoring will be performed semi-annually during closure and post-closure. Four (4) will take place during closure and 60 during post-closure. The detection monitoring system for RCRA units at Grassy Mountain consists of 37 wells including background wells. Each well is sampled for complete Class 1 and Class 3 analyses. The QA/QC requires 10% duplicate analysis for each sampling event. In addition, there is normally one volatile constituent blank for each day of sampling and one field blank for each week of sampling. Each sampling event requires a three person crew at approximately 10 hours per day for nine days. Each monitoring event requires supporting documentation of the sample analysis and the event records to support such aspects as QA/QC at the site and laboratory as well as the numerous other aspects of the event. The records must also be developed into the necessary format for submittal to the regulatory personnel. Sample analytical costs are listed separate. | | |
| Wells | Number | 37 |
| Sample Days Per Well | Days | 0.24 |
| Sample Days Per RCRA Event | Days | 9 |
| Samples Per Well Per Sample Event | Count | 1 |
| Duplicate Samples Per Sample Event | Count | 6 |
| Volatile Samples (Duplicates) | Count/Day | 1 |
| Field Blanks (One/Week) | Count | 2 |
| Background Wells | Count | 4 |
| RCRA Downgradient Wells | Count | 20 |
| Industrial Waste Cell 3 Downgradient Wells | Count | 3 |
| PCB Cell Downgradient Wells | Count | 21 |
| Total Wells | Count | 58 |
| Total RCRA Wells, Including Background Wells and TSCA Wells Being Monitored | Count | 55 |
| The groundwater monitoring effort for all RCRA wells is provided from an outside source for Grassy Mountain and includes analytical costs from STL (Source: Cameron-Cole & STL adjusted to long term market pricing, 2001) | $/Year | $117,430 |
| Per well costs for groundwater monitoring efforts are based on the fact that RCRA and background wells are monitored semi-annually. | $/Well/Year | $2,135 |
| Well maintenance for all wells is estimated (Source: Cameron-Cole) | $/Year | $1,000 |
| Well maintenance for RCRA wells | $/Year | $603 |

| ANCILLARY CLOSURE ACTIVITIES | | |
|---|---|---|
| **Leachate Management** | | |
| Leachate management involves the removal, storage and assumed off-site transport to the Los Angeles facility for all leachate expected to be generated during the closure period. The current operation pumps the leachate from all cells to a portable tank unit that is transferred to the leachate storage tanks until transport off-site. For cells closed as of December 1999, the leachate volume for the closure time period of the other cells is assumed to be the same as the leachate volume produced in December 1999. | | |
| Leachate generation volume is derived from historical experience (January 1999 through December 1999). These rates are presented below. This assumption is conservative since closed landfill cell leachate generation rates will decrease over time after closure. The assumed volumes are applied against the expected 24-month closure period to obtain the estimated annual volume (365 days x gal/day x 6 RCRA cells and 2 IWC's handled as RCRA). | Days/Year | 365 |
| IWC1 | Gal./Day | 55.9 |
| IWC2 | Gal./Day | 0.1 |
| RCRA Cell 1 | Gal./Day | 0.9 |
| RCRA Cell 2 | Gal./Day | 11 |
| RCRA Cell 3 | Gal./Day | 0.9 |
| RCRA Cell 4 | Gal./Day | 271.2 |
| RCRA Cell 5 | Gal./Day | 261 |
| RCRA Cell 7 | Gal./Day | 716 |
| Total leachate collected per day | Gal./Day | 1,317 |
| Total leachate collected per week | Gal./Week | 9,219 |
| Leachate Collection and Storage Costs – Truck, Tank and Driver (Source: Americon 2001) | $/Day | $200 |
| Hours Operated Per Day | Hours/Day | 10 |
| Days Per Week | Days/Week | 4 |
| Total | $/Week | $800 |
| Unit Cost of Leachate Collection | $/Gal. | $0.09 |
| **Run-On/Run-Off Control Maintenance (Source: Americon 2001)** | | |
| Run-On/Run-Off control maintenance involves the routine maintenance of the erosion and degradation of the landfill or other required cover structures, run-off trenches and piping and any collection basins at the facility. It has been estimated (worst case) that within the overall 24-month closure schedule, approximately one full crew day per month would be utilized for routine maintenance. The maintenance crew is comprised of the following (8 hours per day): | | |
| 1 Laborer | $/Hour | $25 |
| 1 Operator | $/Hour | $30 |
| 1 Backhoe/Loader | $/Hour | $65 |
| Hourly Cost of Maintenance Crew | $/Hour | $120 |
| Unit Cost of Maintenance Crew (8 Hour Day) | $/Day | $960 |
| Frequency of Maintenance | Days/Month | 1 |
| **Security and Inspection** | | |
| Security and site inspection is expected to be maintained as currently required during the active site closure (i.e. decontamination, cover placement, etc.) of the facility. This would require 24-hour security at the main gate. It is expected that this will be necessary during the first 12 months of closure. Since the remainder of the closure effort (placement of landfill final cover) will take place after all probably exposure to hazardous constituents has been removed no continuation of security at this level is expected. The cost of security personnel including all payroll and overhead requirements have been computed as follows: | | |
| Security Coverage | Hours/Day | 24 |
| Security Coverage | Days | 365 |
| Fraction associated with RCRA Cells (8 RCRA out of 12 Cells) | Fraction | 0.67 |
| Unit Cost of Personnel (Source: APS, 2000) | $/Hour | $17.80 |
| **Mobilization/Demobilization of Heavy Equipment** | | |

| | | |
|---|---|---|
| It is expected that the heavy equipment to be utilized in the closure process will already be on site for other closure activities, therefore no mobilization or demobilization costs have been added for container management facility closure. The heavy equipment expected to be utilized in the general process is listed below (for estimating purposes it has been assumed that all equipment must be hired). Some equipment may not be listed herein since its function will be mobilization over public highway, and thus mobilization is part of its function and has been included in the cost estimate. Current mobilization cost for tractor/flatbed trailer transport from Salt Lake City (obtained from Knight Transportation, 1999) is $375/one-way or $750 per trip. The total mobilization cost can then be multiplied by 2 to include the demobilization of equipment. Conservatively, typical mob/demob for each piece of heavy equipment would not exceed $1,500 (Source: Americon, 2001) | | |
| Unit Charges | $/Round Trip | $1,500 |
| Number of Trips | Count | 6 |
| **Closure Cost** | **$** | **$9,000** |
| **Site Regrading (Source: Americon, 2001)** | | |
| Includes replacement soils from on-site locations. | | |
| Borrow soil excavated and haul. | $/ $Yd^3$ | $3.10 |
| Site Regrading | $/ $Yd^3$ | $1.23 |
| Unit Cost | $/ $Yd^3$ | $4.33 |
| Replacement Volumes (Soils removed from around containment areas). | $Yd^3$ | 200 |
| Replacement Volume Surface Impoundment | $Yd^3$ | 1,556 |
| **Sump Testing (Hydrostatic) (Source: Americon, 2001)** | | |
| Since most of the labor, equipment and materials will be available for the sump testing, a lump sum estimate ($/test) has been established. The engineering technician costs associated with the testing have been included in the closure certification costs. A total of 11 sumps are attributed to the areas being closed as part of this site-wide closure. | | |
| Number of Sumps | Count | 11 |
| Unit Cost | $/Test | $200 |
| **Equipment Decontamination (General)** | | |
| Decontamination of equipment used in closure and HWMU decontamination activities will be performed at a truck wash area of the facility. For estimating purposes, each piece of equipment (or group of small tools/equipment) is considered a "unit". Each unit is estimated to have a constant surface area. The estimates for water generated to decontaminate containment areas is used to calculate the cost of decontamination. | | |
| Areas Per Unit Decontaminated | Sq. Ft. | 500 |
| Usage Per Area (Initial and Final Rinse) | Gal./Sq. Ft. | 2.6 |
| Quantity of Water Per Unit | Gal. | 1,300 |
| Unit Cost | $/Sq. Ft. | 3.37 |
| Cost Per Unit of General Decontamination | $/Unit | 1,686 |
| The following list provides typical units assumed to require decontamination at completion of closure operations. The decontamination residuals generated will be treated and disposed in accordance with other sections of this document. | | |
| Tank Trucks | Count | 2 |
| Haul Trucks (20 Yards) | Count | 8 |
| Roll-Off Boxes | Count | 24 |
| Vacuum Trucks | Count | 1 |
| Front-End Loader | Count | 1 |
| Bulldozers | Count | 2 |
| Backhoes | Count | 1 |
| Unit of 4 Pumps and 200 Feet of Hoses | Count | 1 |
| Lift Trucks | Count | 1 |
| Compactors | Count | 1 |
| Tota l Number of Units | Count | 42 |
| **Truck Wash Station Decontamination** | | |

| | | |
|---|---|---|
| At completion of facility decontamination and equipment/general decontamination, the truck wash unit will be decontaminated. This area is not a formally permitted unit but is ancillary to permitted units and a requirement of normal housekeeping practices by Grassy Mountain. The decontamination residuals generated will be treated and disposed of in accordance with other sections of this document. The unit may remain "in-service" after decontamination. The area to be decontaminated is about 5,500 square feet (55 x 100 feet). It is assumed that the contiguous soils and gravel ramps into and out of the units (20 x 40 feet x 4 ramps) will be removed to a depth of two feet and disposed on-site. This volume is calculated to be approximately 237 cubic yards of solids for landfill disposal. | | |
| Area to be Decontaminated (55 x 100 feet) | Sq. Ft. | 5,500 |
| Soils Excavation From Ramps (20 x 40 feet x 4 ramps) | Sq. Ft. | 3,200 |
| Depth of Soil Excavation | Feet | 2 |
| Volume of Excavated Soil | $Yd^3$ | 237 |

| CLOSURE CERTIFICATION | | |
|---|---|---|
| Decontamination verification will be performed to support the closure certification. For Closure Cost Estimate purposes, it has been assumed that sampling and analysis of grab samples from rinse waters from final decontamination efforts will be used to confirm decontamination even though other methods may be used. | | |
| **Sampling to Confirm Decontamination** | | |
| The number of rinse water samples is based on the number of tanks and the number of containment areas. The number of soil random, 50 foot interval, grab sample basis. A breakout of samples is shown below. Note, it is assumed that the entire one half acre beneath the surface impoundment will be sampled after removal utilizing a 50 foot grid spacing. In addition, 10 random samples are assumed to be taken of the "clean" water prior to using it for the decontamination process to establish background levels. | | |
| Container Management Facility Samples | Water | 6 |
| Container Management Facility Samples | Soil | 20 |
| Container Management Facility PCB Samples | Water | 10 |
| Container Management Facility PCB Samples | Soil | 55 |
| Waste Treatment Tank System Samples | Soil | 9 |
| Caustic Liquid Containment Area Samples | Water | 3 |
| Acid Liquid Containment Area Samples | Water | 3 |
| Treated Liquid Containment Area Samples | Water | 2 |
| Neutralization Building Samples | Water | 0 |
| **Total WWTS Water Samples:** | **Count** | **8** |
| Stabilization Tank System Samples | Soil | 18 |
| Stabilization Tank System Samples | Water | 6 |
| Stabilization Tank System PCB Samples | Soil | 20 |
| Stabilization Tank System PCB Samples | Water | 5 |
| Waste Solvent Tank System Samples | Soil | 3 |
| Waste Solvent Tank System Samples | Water | 3 |
| Leachate Treatment Tank System Samples | Soil | 4 |
| Leachate Treatment Tank System Samples | Water | 2 |
| Surface Impoundment Unit A Samples | Soil | 25 |
| Surface Impoundment Unit A Samples | Water | 1 |
| Background Samples | Water | 10 |
| **Estimated Total Soil Samples:** | **Soil** | **79** |
| **Estimated Total Water Samples:** | **Water** | **36** |
| Rinse Water Analysis to Confirm Decontamination and Soil Analysis (Source: STL, 2001)<br>For estimating purposes all liquid samples will be analyzed for appropriate 40 CFR Part 261 Appendix IX – Hazardous Constituents. For estimating purposes, all soil/solids samples will be analyzed in the same manner as the liquid samples with the additional Method 1311 TCLP analysis for appropriate parameters contained in 40 CFR Part 261, Appendix IX. Sampling costs are not presented as separate costs since it is expected that certification personnel will be providing this service as part of the certification documentation. PCB Soil/Wipe or Liquid samples cost of analysis is confirmed by Severn-Trent Leboratories (STL-Denver), 2001. Also, confirmed by Aragonite NELAP laboratory, 2005. | | |
| Unit Cost (Liquid Sample for PCB) | $/Sample | $100 |
| Unit Cost (Soil/Wipe Sample for PCB) | $/Sample | $100 |
| Unit Cost (Liquid Sample) | $/Sample | $1,500 |
| Unit Cost (Soil/Solid Sample) | $/Sample | $2,800 |
| **Certification Documents by Independent Professional Engineer** | | |

| | | |
|---|---|---|
| Inspection is not required during inventory processing and is not necessarily continuous during decontamination efforts. However, to be conservative, continuous inspection tmie by the engineering certification staff for the closure decontamination effort is estimated to be 12 hours per shift (day), considering site location and tasks (60 hours per week). The estimated duration of decontamination efforts is 75 shifts, or a maximum of 75 days, at 1 shift per day. This is 15 weeks broken down into 5 weeks for Container Management Facility and 10 weeks for the balance of the site wide closure activities. For a project of this magnitude, it would be unreasonable to expect that efficiencies would not be built into the project planning; therefore it is assumed that "concurrent" closure of the Container Management Facility would occur while the site wide closure takes place. However, the closure certification for the CMF is costed separately as if it were to occur independent of the site wide closure. Supervision of closure inspections by the certifying Professional Engineer (PE) is estimated to be approximately 10 hours per week (10 x 10 = 100 hours). Initial permit review and final report preparation is also estimated at 10 hours per week additional, for a total PE estimate of 200 hours. Other engineering staff (ES) task contributions are expected to be 50% of the effort spent on site inspection tasks. Thus 50% of 600 hours and 200 hours equals 400 hours. Clerical staff (CS) assistance per week of inspection time is estimated to be approximately 15 hours per week (15 x 10 = 150 hours). Note – task estimates have been provided based on experience and project comparisons with other closure activities. The certification and QA/QC inspection for landfill closure has been included in the cost of the final cover of each open cell, therefore no costs attributable to this activity have been included. | | |
| Number of Weeks | Weeks | 10 |
| Shifts Per Week | Shifts/Week | 5 |
| On-Site Engineering Staff Inspection Time (Site Closure – CMF concurrent with site wide closure) | No. Shifts | 50 |
| | Hours/Shift | 12 |
| | Hours | 600 |
| On-Site Engineering Staff Inspection Time (CMB Closure) | No. Shifts | 25 |
| | House/Shift | 12 |
| | Hours | 300 |
| Professional Engineer (PE) Supervision of Closure Inspections | Hours/Week | 10 |
| Professional Engineer (PE) Permit Review and Final Report Preparation | Hours/Week | 10 |
| Professional Engineer (PE) | Hours | 200 |
| Engineering Staff (ES) Support Functions | Fraction of Site Inspections | 0.50 |
| Engineering Staff (ES) Support Functions | Hours | 400 |
| Clerical Staff (CS) | Hours/Week | 15 |
| Clerical Staff (CS) | Hours | 150 |
| It is expected that the inventory management and facility decontamination will take approximately 130 crew days. The estimates included herein have been based on decontamination efforts only as it is not necessary to witness inventory management as those activities are the current ones performed under the permit. The estimate can be affected substantially downward by an increase in number of crews to shorten the calendar time required for closure and thus time required for closure certification inspectors to be on-site. | Crew Days | 130 |
| **Site Wide Certification Summary** | | |
| ES (85 Crew Days) | $ | $85,000 |
| PE (125 Crew Days) | $ | $25,000 |
| CS (27 Crew Days) | $ | $4,050 |
| **Subtotal** | $ | 114,050 |
| Miscellaneous Expenditures (Fraction of Total) | Fraction | 0.15 |
| Miscellaneous Expenditures | $ | $17,108 |
| **Total Estimate** | $ | $131,158 |
| **CMB Cost Summary** | | |
| Note – Container Management Facility Cost, if separate, is half of this estimate based on a 5 week duration. (Fraction of Site Wide) | Fraction | 0.50 |
| **Total Estimate CMB** | $ | $65,579 |
| Landfill Capacity Assurance<br>Sufficient landfill capacity must be remaining to maintain commitments for landfilling inventory and residuals destined for on-site disposal. This quantity is tabulated (based on calculations shown in the | | |

| | | |
|---|---|---|
| Worksheets) in the body of the Closure Plan within Table B. | | |

| POST-CLOSURE COST CONSIDERATIONS | | |
|---|---|---|
| Leachate Management System Maintenance (Source: Americon, 2001)<br>Leachate system maintenance primarily involves transportation and the replacement and reconditioning of the leachate collection and detection system evacuation pumps and miscellaneous related items. The replacement/reconditioning of half the pumps is estimated to be necessary every three years. The total number of leachate collection pumps at the existing facility is 82. Approximately 14 pumps would be expected to need replacement annually. | | |
| Leachate pumps (RCRA) | Count | 82 |
| Pumps Replaced Per Year | Count | 14 |
| 2 Laborers for 3 Hours at $35/hour | $ | $210 |
| Pump Replacement Costs | $ | $560 |
| Single Pump Replacement Cost | $ | $770 |
| **Estimated Annual Cost of Leachate Pump Replacements:** | **$/Year** | **$10,780** |
| Leachate Pumping and Disposal Costs<br>For the cells already closed during preparation of this plan, assume the leachate volumes collected will continue to decrease at the rate they have been decreasing for the past two years. It is assumed that he first two years of post closure will produce volumes of leachate equal to those assumed for the two-year closure period. The third year of post closure is assumed to have leachate produced at a rate equal to December 1999 and then to decrease from that volume at the same rate as from the high volume in 1999 to December 1999. There has been no significant precipitation from August 1999 to December 1999, so these volume decreases should be indicative of the volume produced when the cells are closed. | | |
| Leachate reduction rate (Years 3-10) (% Reduction Per Year) | % | 0.10 |
| **December 1999 Leachate Volumes** | | |
| IWC1 | Gal./Day | 55.9 |
| IWC2 | Gal./Day | 0.1 |
| RCRA Cell 1 | Gal./Day | 0.9 |
| RCRA Cell 2 | Gal./Day | 11.0 |
| RCRA Cell 3 | Gal./Day | 0.9 |
| RCRA Cell 4 | Gal./Day | 164.8 |
| RCRA Cell 5 | Gal./Day | 210.3 |
| RCRA Cell 7 | Gal./Day | 133.4 |
| Total Leachate Collected / Day | Gal./Day | 577 |
| Total Leachate Collected / Year | Gal./Year | 210,715 |
| Average Reduction in Leachate Volumes (September to December 1999) | | |
| IWC1 | Gal./Day | 1.53 |
| IWC2 | Gal./Day | 0.07 |
| RCRA Cell 1 | Gal./Day | 0.01 |
| RCRA Cell 2 | Gal./Day | 2.51 |
| RCRA Cell 3 | Gal./Day | 0.35 |
| RCRA Cell 4 | Gal./Day | 67.88 |
| RCRA Cell 5 | Gal./Day | 53.75 |
| RCRA Cell 7 | Gal./Day | 113.73 |
| Total Leachate Collected / Day | Gal./Day | 239.83 |
| Total Leachate Collected / Year | Gal./Year | 87,537.95 |
| Leachate Collection and Disposal Costs | $/Gal. | $0.85 |
| Year 1 of Post-Closure | $ | $390,363 |
| Year 2 of Post-Closure | $ | $390,363 |
| Year 3 (December 1999 Volumes Annualized) (210,714.50 Gallons/Year) | $ | $179,157 |
| Year 4 (123,176.55 Gallons/Year) | $ | $104,729 |
| Year 5 (35,638.60 Gallons/Year) | $ | $30,301 |
| Year 6 (Labor Costs to Check Sumps) | $ | $9,600 |
| Year 7 | $ | $9,600 |
| Year 8 | $ | $9,600 |

| | | |
|---|---|---|
| Year 9 | $ | $9,600 |
| Year 10 | $ | $9.600 |
| Years 11-30 | $ | $192,000 |
| **Total Post-Closure Leachate Management:** | **$** | **$1,334,915** |
| **CAP (Final Cover Run-Off Control) Maintenance (Source: Americon, 2001)** | | |
| Cap maintenance involves the routine maintenance of the erosion and degradation of the landfill covers or other required cover structures, run-off trenches and/or piping and any collection basins at the facility. The number o crew days required annually for routine maintenance is base on the overall post-closure schedule. | | |
| Crew Days Per Year | Days/Year | 8 |
| Hourly Cost of Maintenance Crew | $/Crew | $115 |
| Length of Day | Hours | 10 |
| Daily cost of Maintenance Crew | $/Crew Day | $1,150 |
| **Estimated Annual Cost for Cap Maintenance:** | **$/Year** | **$9,200** |
| **Routine Inspections (Source: Americon, 2001)** | | |
| Security and site inspection is expected to be performed as a function of facility maintenance. This would require one 10-hour workday once per month during the post-closure period. It is expected that this effort will coincide with the annual administrative/certification report of compliance with the post-closure requirements. Any reporting effort will be coordinated with the appropriate authorized party during the post-closure period. | | |
| Inspection Time | Hrs./Month | 10 |
| Unit Cost of Personnel | $/Hour | $65 |
| **Estimate of Annual Cost of Routine Inspections:** | **$/Year** | **$7,800** |

| ANNUAL POST-CLOSURE CERTIFICATION AND ADMINISTRATION | | |
|---|---|---|
| **Annual Certification/Administration Report** | | |
| During the post-closure period an annual report will be prepared by the Permittee or designated third-party which documents all of the activities for each hazardous waste management unit (HWMU) at the facility during each one year period. These documents will include copies of all other reporting requirements delineated herein including site inspections, leachate generation, manifest documents for leachate management, groundwater monitoring results, etc. These documents will be maintained at a designated repository for use by the certifying authority at the end of the 30-year post-closure period for each HWMU. For estimating purposes, this report is assumed to be prepared by the Independent Professional Engineer documenting the post-closure activities. The following information is the estimate for effort in complying with this requirement. | | |
| **Annual Independent Professional Review (Source: Americon, 2001)** | | |
| The post-closure activities inspection time Engineering Staff (S) is estimated to be 180 hours per year considering site location and task delineated herein above. Inspection/management time annually by a Professional Engineer (PE) is estimated to be approximately 20 hours. Other technical staff (ES) support task contributions are expected to be 50% of the effort spent on site inspection tasks. | | |
| ES | \$/Hour | \$85 |
| ES Post-Closure Inspection Time | Hours | 180 |
| ES Support Functions | Hours | 90 |
| **Total ES Costs:** | **\$/Year** | **\$22,950** |
| PE | \$/Hour | 125 |
| PE | Hours | 20 |
| **Total PE Costs:** | **\$/Year** | **\$2,500** |
| **Subtotal:** | **\$/Year** | **\$25,450** |
| Miscellaneous Expenditures (Fraction of Subtotal) | Fraction | 0.15 |
| Miscellaneous Expenditures | \$/Year | \$3,818 |
| **TOTAL FINAL POST-CLOSURE CERTIFICATION:** | **\$/Year** | **\$29,268** |
| **Certification Documents by Independent Professional Engineer (Source: ERM, 2001)** | | |
| The final certification for each HWMU to meet the requirements of R315-8-7 will be compiled utilizing the annual documents outlined herein before. It is expected that this review will require approximately 30 hours by professional staff for each unit as the 30-year period is completed. In addition to this will be the required administration and documentation to accompany the certification, which is estimated to cost approximately 40% of the professional staff fees. There are currently 8 units, which will be subject to post-closure certification. This is a one-time cost. | | |
| **HWMU Post-Closure Certification** | | |
| Professional Engineer | Hours/Unit | 30 |
| Professional Engineer | \$/Hour | \$125 |
| Total PE | \$/Unit | \$3,750 |
| Miscellaneous Expenditures (Fraction of Subtotal) | Fraction | 0.40 |
| Miscellaneous Expenditures | \$/Unit | \$1,500 |
| Total unit Cost of Post-Closure Certification | \$/Unit | \$5,250 |
| Number of Post-Closure units | Count | 8 |
| Estimated Total Cost of HWMU Post-Closure Certification | \$ | \$42,000 |
| **Administrative and Contingency Costs** | **Fraction** | **0.10** |
| **Contingency for Potential RFI's / Corrective Action** | **Fraction** | **0.10** |
| **Length of Post-Closure** | **Years** | **30** |

| CDA – Landfill Closure | Unit Cost | Unit | RCRA Cell 4 (Closure) | | RCRA Cell 5 (Closure) | | RCRA Cell 7 (Closure) | |
|---|---|---|---|---|---|---|---|---|
| | | | Qty[1] | Total Cost | Qty[1] | Total Cost | Qty[1] | Total Cost |
| Mobilize/Demobilize | 200,000 | EA | 1 | $200,000 | 1 | $200,000 | 1 | $200,000 |
| Subgrade Preparation | 1.00 | SY | | | | | | |
| Embankment | 5.00 | CY | | | | | | |
| Clay Liner-New Cell | 12.00 | CY | | | | | | |
| Clay Liner-Closure | 17.00 | CY | 13,100 | $222,700 | 11,700 | $198,900 | 13,300 | $226,100 |
| Clay Soils Placement (Cost includes finishing.) | 11.00 | CY | 4,900 | $53,900 | 4,400 | $48,400 | 5,000 | $55,000 |
| 60 mil HDPE (Cost includes 8 mil liner.) | 3.18 | SY | 70,341 | $223,685 | 69,966 | $222,492 | 89,392 | $284,267 |
| GCL | 4.08 | SY | 59,151 | $241,335 | 59,599 | $243,163 | 77,087 | $314,516 |
| Geotextile | 1.44 | SY | 62,421 | $89,886 | 62,893 | $90,566 | 81,350 | $117,144 |
| Geonet | 1.94 | SY | 62,421 | $121,096 | 62,893 | $122,012 | 81,350 | $157,820 |
| Perimeter HDPE Weld | 2.25 | LF | 3,268 | $7,353 | 2,920 | $6,570 | 3,320 | $7,740 |
| Excavate Anchor Trench | 7.00 | LF | 3,268 | $22,876 | 2,920 | $20,440 | 3,320 | $23,240 |
| Leachate Collection | 50,000 | EA | 1 | $50,000 | 1 | $50,000 | 1 | $50,000 |
| Imported Sand | 14.00 | CY | 11,600 | $162,400 | 11,700 | $163,800 | 15,200 | $212,800 |
| Protective Soil Cover | 6.00 | CY | 38,100 | $228,600 | 38,000 | $229,800 | 49,600 | $297,600 |
| Drainage (Covers Misc. from Quantity Estimates) | 75,000 | LS | 1 | $75,000 | 1 | $75,000 | 1 | $75,000 |
| Road Base Placement | 7.50 | CY | 160 | $1,200 | 150 | $1,125 | 170 | $1,125 |
| Gravel Armor | 8.50 | CY | 7,300 | $62,050 | 7,400 | $62,900 | 9,600 | $81,600 |
| **Subtotal** | | | | **$1,712,081** | | **$1,685,168** | | **$2,053,832** |
| Design, QC, QA, PM, Survey | 22 | % | 22 | $376,658 | 22 | $370,737 | 22 | $451,843 |
| Final Waste Grading | 75,000 | EA | 1 | $75,000 | 1 | $75,000 | 1 | $75,000 |
| Security | 50,000 | LS | 1 | $50,000 | 1 | $50,000 | 1 | $50,000 |
| **TOTAL** | | | | **$2,213,739** | | **$2,180,905** | | **$2,630,675** |

[1] See CDA Cell Closure Quantity Estimates.

## CDA Cell Closure Quantity Estimates
## (Factors Determined Using the Surface Area and Perimeter Lengths of Each Cell)

| | | | Cell 4 | Cell 5 | Cell 7 | IWC 1 | | IWC 2 | | Cell Y | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Perimeter (Feet) | | | 3,268 | 2,920 | 3,320 | 2,674 | | 2,777 | | 2,240 | | | |
| Area (Sq. Ft.) | | | 528,608 | 532,576 | 688,900 | 242,136 | | 338,077 | | 313,000 | | | |
| **Item Description** | **Qty. Factor** | **Apply Factor To:** | | | | | **Factor** | | **Factor** | | **Factor** | **Avg. Factor** | **Use Factor** |
| **Earthwork** | | | | | | | | | | | | | |
| Imported Sand Material (Yd3) | 0.0220 | Area | 11,600 | 11,700 | 15,200 | 4,378 | 0.01808 | 8,245 | 0.02439 | 7,450 | 0.0238 | 0.0221 | 0.0220 |
| Clay Liner Placement (Yd3) | 4.0000 | Perimeter | 13,100 | 11,700 | 13,300 | 4,238 | 1.58489 | 3,557 | 1.28088 | 13,265 | 5.91923 | 2.9283 | 4.0000 |
| Clay Liner Finishing (Yd3) | 3.0000 | Perimeter | 9,800 | 8,800 | 10,000 | 5,216 | 1.95064 | 4,925 | 1.7735 | 7,774 | 3.46899 | 2.3977 | 3.0000 |
| Clay Soil Material (Yd3) | 1.5000 | Perimeter | 4,900 | 4,400 | 5,000 | 2,216 | 0.82872 | 2,202 | 0.79294 | 4,261 | 1.90138 | 1.1743 | 1.5000 |
| Anchor Trench (Linear Feet) | 1.0000 | Perimeter | 3,300 | 2,900 | 3,300 | 2,674 | 1 | 2,777 | 1 | 2,241 | 1 | 1.0000 | 1.0000 |
| Imported Soil Cover (Yd3) | 0.0720 | Area | 38,100 | 38,300 | 49,600 | 17,260 | 0.07128 | 25,180 | 0.07448 | 21,840 | 0.06978 | 0.0718 | 0.0720 |
| Gravel Armor Plating (Yd3) | 0.0139 | Area | 7,300 | 7,400 | 9,600 | 3,370 | 0.01392 | 4,670 | 0.01381 | 4,360 | 0.01393 | 0.0139 | 0.0139 |
| Road Base (Yd3) | 0.0500 | Perimeter | 160 | 150 | 170 | 120 | 0.04488 | 140 | 0.05041 | 120 | 0.05355 | 0.0496 | 0.0500 |
| **Miscellaneous** | | | | | | | | | | | | | |
| Drainage Pipe – 18# Dia. Linear Foot | 0.3500 | Perimeter | 1,140 | 1,020 | 1,160 | 1,284 | 0.48018 | 1,146 | 0.41268 | 350 | 0.15618 | 0.3497 | 0.3500 |
| Inlet Boxes (Each) | 0.0017 | Perimeter | 6 | 5 | 6 | 4 | 0.0015 | 6 | 0.00216 | 3 | 0.00134 | 0.0017 | 0.0017 |
| Manholes (Each) | 0.0012 | Perimeter | 4 | 4 | 4 | 4 | 0.0015 | 3 | 0.00108 | 2 | 0.00089 | 0.0012 | 0.0012 |
| Outlet Structures (Each) | 0.0003 | Perimeter | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0.00089 | 0.0003 | 0.0003 |
| **Geosynthetics** | | | | | | | | | | | | | |
| 60-mil HDPE Liner (Sq. Ft.) | 0.9750 | Area | 515,400 | 519,300 | 671,700 | 235,557 | 0.97283 | 341,226 | 1.00931 | 294,714 | 0.94158 | 0.9746 | 0.9750 |
| 60-mil HDPE Textured Liner (Sq. Ft.) | 20.000 | Perimeter | 65,400 | 58,400 | 66,400 | 34,317 | 12.8336 | 33,600 | 12.0994 | 51,940 | 23.1772 | 16.0367 | 20.000 |
| Drainage Net (Sq. Ft.) | 0.9750 | Area | 515,400 | 519,300 | 671,700 | 235,557 | 0.97283 | 341,226 | 1.00931 | 294,714 | 0.94158 | 0.9746 | 0.9750 |
| Geotextile Fabric (Sq. Ft.) | 0.9750 | Area | 515,400 | 519,300 | 671,700 | 235,557 | 0.97283 | 341,226 | 1.00931 | 294,714 | 0.94158 | 0.9746 | 0.9750 |
| Geosynthetic Clay Liner (Sq. Ft.) | 0.9240 | Area | 488,400 | 492,100 | 636,500 | 220,113 | 0.90905 | 325,080 | 0.96156 | 282,240 | 0.90173 | 0.9241 | 0.9240 |
| 8-mil Poly Membrane (Sq. Ft.) | 5.0000 | Perimeter | 16,300 | 14,600 | 16,600 | 12,987 | 4.85677 | 13,626 | 4.90673 | 11,151 | 4.9759 | 4.9131 | 5.0000 |

## D. PCB COMMERCIAL STORAGE CLOSURE COST ESTIMATE

### 19. ANNUAL REVIEW OF INITIAL COST ESTIMATE

This section includes the estimated cost of closure activities including the sampling, transportation, disposal, equipment costs and labor involved in such activities. The costs used for disposal reflect current industry pricing as of the date of this revision. The cost of closure estimates shall be adjusted annually for inflation and may be adjusted for changes in market conditions.

### 20. CLOSURE COST ESTIMATE

The PCB sample analysis costs for various media (e.g. oil, water, soil, wipe) are based on quotations received from one or more Utah Certified Commercial Laboratories. Uncoated concrete surfaces will be sampled using destructive core sampling. Coated (impervious) concrete surfaces will be wipe sampled if in good condition.

### 4.1. Tank Farm

### 4.2. PCB Oil Disposal Charges

| | | |
|---|---|---|
| **(a) Askarel PCB Oil Disposal by Incineration at Aragonite:** | | |
| | 53,325 Gallons x 13.5 lb./Gallon | = 719,888 lbs. |
| | 719,888 lbs. x $0.12/lb[2] | = $86,387 |
| **(b) Askarel PCB Oil Transportation To Aragonite:** | | |
| | $600 per Day[3] / 2 Loads per Day | = $300 / Load |
| | $300 / Load / 40,000 lbs. / Load | = $0.008 / lb. |
| | 719,888 lbs. x $0.008 / lb | = $5,759 |
| **(c) Water Disposal by Incineration at Aragonite:** | | |
| | 10,657 Gallons x 8.3 lbs. / Gallon | = 88,453 lbs |
| | 88,453 lbs. x $0.16 / lb.[1] | = $14,152 |
| **(d) Water Transportation To Aragonite:** | | |
| | $600 per Day[3] / 2 Loads per Day | = $300 / Load |
| | $300 / Load / 40,000 lbs. / Load | = $0.008/lb |
| | 88,453 lbs. x $0.008 / lb. | = $708 |
| **(e) Personnel:** [4] | | |
| | Supervisor (1) x 5 days x $450 / Day | = $2,250 |
| | Labor to load tanker provided by transportation company | |
| | **Sub-Total PCB Oil Disposal Charges** | **= $109,255** |

[2] Market PCB Incineration Prices per September 2001 Correspondence with EPA Region 8.
[3] MP Environmental, 2001.
[4] Americon, 2001.

## 4.2. Bulk Tank Disposal

| | |
|---|---|
| **(a) Bulk Tank Disposal at Grassy Mountain** | |
| Assume tanks weigh 1.5 lbs. / Gallon of Capacity.<br>(i.e. Each 10,000 gallon tank weighs 15,000 lbs. when empty.) | |
| 63,590 Total Tank Farm Gallons x 1.5 lbs. / Gal. | = 95,385 lbs. |
| 95,385 lbs. x $0.04 / lb. | = $3,815 |
| **(b) Transportation to Grassy Mountain Cell** | |
| $600 per Day[2] / 2 Loads per Day | = $300 / Load |
| $300 / Load / 40,000 lbs. / Load | = $0.008 / lb. |
| 95,385 lbs. x $0.008 / lb. | = $ 763 |
| **(c) Removal** [3] | |
| Technicians (2) x 2 Days x $400 / Day | = $1,600 |
| **(d) Crane** [3] | |
| 2 Days x $850 / Day (Includes Crane Operator) | = $1,700 |
| **"Landfill Capacity Assurance" Required at Closure:**<br>(95,385 lbs. x 0.000075 Yard$^3$/lb. of Carbon Steel) | **7.5 Yards** |
| **Sub-Total Bulk Tank Disposal** | **= $7,878** |

## 4.2. Area Decontamination - Concrete Removal

This section describes the decontamination and concrete removal of Tank Farm Containment Area with a volume of 9,099 $ft^3$.

| | |
|---|---|
| **(a) Concrete Breaker** [3] | |
| $250 / Day x 5 Days | = $1,250 |
| **(b) Loader** [3] | |
| $175 / Day x 5 Days | = $875 |
| **(c) Disposal at Grassy Mountain** | |
| 9,099 $ft^3$ / 27 $ft^3$ per $Yd^3$ | = 337 $Yd^3$ |
| 337 $Yd^3$ x 3,000 lbs. / $Yd^3$ | = 1,011,000 lbs. |
| 1,011,000 lbs. x $0.04 / lb. | = $40,440 |
| **(d) Transportation to Grassy Mountain Cell** | |
| $600 per Day [2] / 2 Loads per Day | = $300 / Load |
| $300 / Load / 40,000 lbs. / Load | = $0.008/lb |
| $0.008 / lb. x 1,011,000 lbs. | = $8,088 |
| **(e) Sampling** | |
| Take 55 underlying soil samples after concrete removal to confirm clean. | |
| 55 Samples x $100 per Sample [5] | =$5,500 |
| **(f) Labor** [3] | |
| 10 Days x Technicians (4) x $400 / Day | = $16,000 |
| 3 Days x 2 Sampler Technicians x $400 / Day | = $2,400 |
| **"Landfill Capacity Assurance" Required at Closure:** | **337 Yards** |
| **Sub-Total Area Decontamination** | **= $74,253** |

[5] Severn Trent Laboratories (STL-Denver), 2001.

## 4.2. Underground Pipeline Removal

| | | |
|---|---|---|
| **(a) Backhoe** [3] | | |
| | $250 / Day x 2 Days | = $500 |
| **(b) Labor** [3] | | |
| | 2 Days x Technicians (3) x $400 / Day | = $2,400 |
| **(c) Supervisor** [3] | | |
| | 2 Days x Supervisor (1) x $450 / Day | = $900 |
| **"Landfill Capacity Assurance" Required at Closure:** | | **4 Yards** |
| **Sub-Total Underground Pipeline Removal** | | **= $3,800** |

## 4.2. Total for Tank Farm

The total closure cost estimate for the PCB Oil disposal, bulk tank disposal, crane, area decontamination and underground pipeline removal is $195,187.

## 4.1. Container Storage Areas

## 4.2. Container Inventory Removal

| | |
|---|---|
| **(a) Cost Calculation** | |
| Treatable Oil: 500 lbs. / Drum x $0.331 / lb. [1] | = $166 / Drum |
| Askarel Oil: 743 lbs. / Drum x $0.331 / lb. [1] | = $246 / Drum |
| Capacitors: 250 lbs. / Drum x $1.16 / lb. [1] | = $290 / Drum |
| Transformers (Drained): 500 lbs. / Unit x $0.16 / lb. [4] | = $80 / Unit |
| **(b) Disposal** | |
| Treatable Oil: 0 Drum x $166 / Drum | = $0 |
| Askarel Oil: 193 Drums x $246 / Drum | = $47,478 |
| Capacitors: 65 Drum x $290 / Drum | = $18,850 |
| Transformers (Drained): 193 Units x $80 / Unit [4] | = $15,440 |
| Debris: 9 Drums x $75 / Drum [4] | = $675 |
| **(c) Transportation** | |
| Transportation prices for incinerables are calculated to the Aragonite, Utah, facility (i.e. water, Askarel and capacitors). Transportation prices for landfillables are calculated to the Grassy Mountain Cell (i.e. transformers and debris). | |
| $600 per Day [2] / 2 Loads per Day | = $300 / Load |
| $300 Per 80 Drum Load | = $3.75 / Drum |
| Treatable Oil: 0 Drum x $3.75 / Drum | = $0 |
| Askarel Oil: 193 Drums x $3.75 / Drum | = $724 |
| Capacitors: 65 Drum x $3.75 / Drum | = $243 |
| Transformers (Drained): 193 Units x $3.75 / Unit | = $723 |
| Debris: 9 Drums x $3.75 / Drum | = $34 |
| **(d) Labor** [3] | |
| It will take 2 technicians 7 days to drain, flush and load 193 transformers. It will take 2 technicians 2 days to remove and load the remaining container material from warehouse area. | |
| 2 Days x Technicians (7) x $400 / Day | = $5,600 |
| 2 Days x Technicians (2) x $400 / Day | = $1,600 |
| **"Landfill Capacity Assurance" Required at Closure:** (Transformers and Debris Only) (193 Transformers @ approx. 55 gal. ea. x 202 gal/yard$^3$ (9 drums @ 55-gallons) | **55 Yards** |
| **Sub-Total Container Inventory Removal** | **= $91,368** |

## 4.2. Transformer Flush and Bulk Tank Disposal

| | |
|---|---|
| **(a) Oil Disposal** | |
| 193 Trans. x 8 lbs. / Gallon | = 6,755 Gallons |
| 54,040 lbs. x 35 Gal. Flush / Trans. [4] | = 54,040 lbs. |
| 6,755 Gallons x $0.12 / lb. [1] | = $6,485 |
| **(b) Oil Transportation To Aragonite** | |
| $600 per Day [2] / 2 Loads per Day | = $300 / Load |
| $300 / Load / 40,000 lbs. / Load | = $0.008 / lb. |
| 54,040 lbs. x $0.008 / lb | = $432 |
| **(c) Tank Disposal Charge** | |
| 3,000 Gallons x 1.5 lbs. / Gallon x 2 x $0.04 / lb.[4] | = $360 |
| **(d) Transportation to Grassy Mountain Cell** | |
| $600 per Day[3] / 2 Loads per Day | = $300 / Load |
| $300 / Load / 40,000 lbs. / Load | = $0.008/lb |
| 9,000 lbs. x $0.008 / lb. | = $72 |
| **(e) Labor** [3] | |
| Technicians (2) x 1 days x $450/day | = $800 |
| **"Landfill Capacity Assurance" Required at Closure:** (9,000 lbs. x 0.000075 yards$^3$/lbs.) | **1 Yards** |
| **Sub-Total Transformer Flush and Bulk Inventory Disposal** | **= $8,149** |

### 4.2. Area Decontamination and Concrete Removal

The concrete containment area has a surface area of 6,730 $ft^2$ and is 1 foot thick. The volume of concrete of the area is 6,730 $ft^3$.

| | |
|---|---|
| **(a) Concrete Breaker** [3] | |
| $250 / Day x 10 Days | = $2,500 |
| **(b) Concrete Saw** [3] | |
| $200 / Day x 5 Days | = $1,000 |
| **(b) Loader** [3] | |
| $175 / Day x 10 Days | = $1,750 |
| **(d) Disposal at Grassy Mountain** | |
| 6,730 $ft^3$ / 27 $ft^3$ per $Yd^3$ | = 249 $Yd^3$ |
| 249 $Yd^3$ x 3,000 lbs. / $Yd^3$ | = 747,000 lbs. |
| 747,000 lbs. x $0.04 / lb.[4] | = $29,880 |
| **(e) Transportation to Grassy Mountain Cell** | |
| $600 per Day [2] / 2 Loads per Day | = $300 / Load |
| $300 / Load / 40,000 lbs. / Load | = $0.008 / lb. |
| $0.008 / lb. x 747,000 lbs. | = $5,976 |
| **(f) Labor** [3] | |
| 10 Days x Technicians (3) x $400 / Day | = $12,000 |
| 2 Days x Sampler Technicians (2) x $400 / Day | =$1,600 |
| **(g) Surface Wipe Sampling** | |
| 12 Wipe Samples x $100 per Sample [5] | =$1,200 |
| **(h) Sampling and Analysis of Soils Under/Around Warehouse** | |
| Take 44 underlying soil samples after concrete removal to confirm clean. | |
| 44 Samples x $100 per Sample [5] | =$4,400 |
| **"Landfill Capacity Assurance" Required at Closure:** (747,000 lbs. Concrete x $Yards^3$/3,375 lbs.) | **222 Yards** |
| **Sub-Total Area Decontamination** | **= $60,306** |

### 4.2. Total for Container Storage Area

The total closure cost estimate for the PCB Container Storage inventory removal, transformer flush and bulk tank disposal, area decontamination and concrete removal is $159,823.

### 4.1. Auxiliary Equipment

It is assumed that 4 rolloff boxes containing 30,000 pounds each of auxiliary equipment and debris will be accumulated and sent to a permitted chemical landfill.

| | |
|---|---|
| **(a) Disposal of Debris at Grassy Mountain** | |
| 120,000 lbs. x $0.04 / lb.[4] | = $4,800 |
| **(b) Transportation to Grassy Mountain Cell** | |
| $600 per Day [2] / 2 Loads per Day | = $300 / Load |
| $300 / Load / 30,000 lbs. / Load | = $0.01/ lb. |
| $0.01 / lb. x 120,000 lbs. | = $1,200 |
| **(c) Labor** [3] | |
| It will take 3 technicians 1 week to disassemble and load auxiliary equipment. | |
| 5 Days x Technicians (3) x $400 / Day | = $6,000 |
| **"Landfill Capacity Assurance" Required at Closure:** (120,000 lbs. x 0.000075 yards$^3$/lbs.) | **9 Yards** |
| **Total Auxiliary Equipment** | **= $12,000** |

### 4.1. Administrative and Supervisor Costs

It is assumed it will take 9 weeks for a Project Manager to coordinate and supervise the closure of the facility.

| | |
|---|---|
| **(a) Labor** [3] | |
| 45 Days x Project Manager (1) x $650 / Day | = $29,250 |
| **Total Administrative and Supervisor Costs** | **= $29,250** |

### 4.1. Closure Certification

The 14 weeks of closure activity must be witnessed and verified by a certified Professional Engineer. It is assumed that this engineer is on site or billing 25% of the time during closure.

| | |
|---|---|
| **(a) Labor** [3] | |
| 70 Days x Engineer (1) x 0.25 x $120 / Hour | = $16,800 |
| **Total Closure Certification** | **= $16,800** |